

**In-Ground Nursery Crops: An Economic Assessment of the
Feasibility of Providing Multiple-Peril Crop Insurance**

*Woody Ornamental Trees and Shrubs, Fruit and Nut Trees,
Vines, Herbaceous Plants, and Unfinished Plants*

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Executive Summary

This report concentrates on insurance for field-grown (or in-ground) nursery crops. The Census, which is the main source of data for this industry, defines nursery crops as including woody ornamental trees and shrubs, fruit and nut trees, vines (including ground covers), and herbaceous (non-woody) plants. Using this definition, the Census reported nearly 20,000 producers of nursery crops in the United States in 1992, with \$2.6 billion in wholesale nursery product sales. Information on unfinished plants (including propagative materials) are also included in the report.

According to the Census, nursery growers reported producing nursery crops on 128 million square feet of land under protective cover and 332,000 acres of open-field area. These nursery farms contained an estimated 1.9 million acres of total land area and had total gross cash farm income from nursery and other crops of \$3.2 billion.

The Census data, which are virtually the only source of information on nursery crops, cannot be separated into "in-ground" and "containerized" categories. However, an estimated 45-55 percent of all nursery crop sales in the U.S. are "non-containerized" plants, all of which are field-grown.

U.S. purchases of nursery plants averaged about \$93 per person at the retail level in 1993, up from about \$63 in 1986. The principal purchasers of nursery plants are homeowners, builders, landscape contractors, grounds maintenance contractors, commercial businesses, retail nurseries, and garden centers. Smaller markets include highway departments, parks, and golf courses. An estimated 50-60 percent of the volume is sold during late winter through early summer, and 25-30 percent is sold in the fall.

Every state produces nursery crops. Nineteen percent of the U.S. acreage is located in the Northeast; 25 percent is in the North Central states; 38 percent is in the South, and 18 percent is in the West. The Census reported 377 U.S. counties with \$500,000 or more in sales of nursery crops in 1992.

The location of in-field nursery production is largely determined by climate, distance to markets, and, sometimes, tradition. Each plant species has a hardiness zone which sets the northern limit for growing that type of plant. In addition to hardiness zone, other climatic conditions are important, such as rainfall, humidity, and heat.

Most growers plant either purchased or self-propagated "liners" (young trees or plants) to be set or "lined-out" in rows in the field. Frequently, liners are planted in the field in the fall, giving the root time for establishment before the plant breaks dormancy in the spring. Planting in the spring or early summer is also practiced.

Liners are small, bare-root trees and plants, or container-grown liners in pots or trays. Broadleaf shrubs and trees (holly, live oak, and magnolia) are often purchased as small container-grown liners. Although container-grown liners are more expensive than bare-rooted plants, there are fewer losses due to desiccation when transplanting. Broadleaf evergreen liners are

particularly susceptible to loss if they are not container-grown. Liner production usually requires 6 to 12 months for the roots to develop adequately and the plant to reach the needed size for planting in the field.

Soil should be tested before planting for nutrient requirements (phosphorus, potassium, calcium, magnesium, manganese, zinc) and nematodes. Fertilization needs vary depending on soil type and type and age of the plants. Generally, broadleaf evergreens (such as hollies) require the lowest fertilizer levels, narrowleaf evergreens require somewhat more, and deciduous trees the highest levels. Clay soils require lower application rates because of their ability to hold nutrients. Sandy soils require the most frequent applications since fertilizer leaches from these soils more readily.

The best time for harvesting (digging) to assure survival of the plant is from late fall to early spring. Plants can be dug at other times, but they must be given special post-digging care. Growers normally avoid harvesting during active shoot elongation because root regeneration is at its lowest point at this time. Field-grown trees and broadleaf evergreens are usually dug when they are dormant since there is less stress due to moisture transpiration. In recent years, however, summer and fall digging has become more commonplace, as anti-transpirants have become available that reduce water loss.

Major production perils include excessive rains, excessive heat, excessive wind, drought, freezing temperatures, and ice damage. Insects and diseases can generally be controlled through management practices. For plants that remain in the nursery field for an extended period (such as ornamental trees), damage may be out-grown and salability may be unaffected.

The damage caused by production perils varies with the type of plant, its age, and the time of year. For example, trees are most susceptible to damage from flooding early in the spring, when their respiration rate is highest. They can withstand a longer period of inundation during winter dormancy, when they are not actively growing.

Ad hoc disaster data can be used to indicate which states with large nursery crop industries received large payments relative to the state's sales. For example, Florida accounted for a large share of U.S. ad hoc disaster payments relative to its sales and acreage, in part due to the effects of Hurricane Andrew in 1992. In contrast, California, New Jersey, and various north central states (such as Michigan and Illinois) collected a smaller share of ad hoc payments relative to their sales and acreage.

Our assessment is that, with a few exceptions, participation in crop insurance for in-ground nursery plants would be concentrated at the minimum catastrophic coverage level. For a very small cost, producers are able to receive coverage from the most serious, catastrophic events. Generally, growers report that they are able to deal with the production perils encountered in nursery crop production. Insects and diseases can be kept in check with proper management, including the use of pesticides. Interest in "buy-up" coverage appears to vary widely from state to state, with the greatest participation likely to occur in southeast Florida, and the Gulf Coast areas of Florida, Alabama, Mississippi, Louisiana, and Texas.

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Introduction

This report concentrates on insurance for field-grown (or in-ground) nursery crops. The Census, which is the main source of data for this industry, defines nursery crops as including woody ornamental trees and shrubs, fruit and nut trees, vines (including ground covers), and herbaceous (non-woody) plants. Using this definition, the Census reported nearly 20,000 producers of nursery crops in the United States in 1992, with \$2.6 billion in wholesale nursery product sales (Table 1).¹ Data and information on unfinished plants (including propagative materials) are also included in the report.

According to the Census, nursery growers reported producing nursery crops on 128 million square feet of land under protective cover and 332,000 acres of open-field area. These nursery farms contained an estimated 1.9 million acres of total land area and had total gross cash farm income from nursery and other crops of \$3.2 billion (ERS estimate). Nursery farms employed about 300,000 workers on a part-time or full-time basis.

The value of the nursery crops inventory is likely several times larger than the total sales figure of \$2.6 billion. Some plants, such as ornamental trees, require a long growing period (3 to 10 years, or longer) before they are sold, and are counted as part of the inventory during each of these years.

The Census data, which are virtually the only source of information on nursery crops, cannot be separated into "in-ground" and "containerized" categories. However, an estimated 45-55 percent of all nursery crop sales in the U.S. are "non-containerized" plants, all of which are field-grown.² On a state-by-state basis, the distribution between container and non-container sales varies widely (Brooker and Turner; Horticultural Research Institute, Inc.)³

In addition to field-grown plant sales, a portion of containerized-plant sales are from nursery stock grown in the field before digging and transplanting to a container. Although not counted as field-grown sales, these containerized plants are part of the in-field inventory at some point and would be covered by an in-field crop insurance policy.

Field production of floricultural crops (including cut flowers, cut greens, and bedding and garden plants), which are included in the broader Census SIC class called "nursery and greenhouse crops," are the focus of separate reports. Christmas trees and turfgrass sod were also the focus of separate reports.

ERS estimate.

Copies of these publications are attached to this report.

Table 1--Nursery crops: Farms, acreage, and sales, by region and State, 1992 and 1987

Region and State	1992				1987			
	Area under		Acreage	Sales	Area under		Acreage	Sales
	Farms	glass or other protection	in the open		Farms	glass or other protection	in the open	
Number	Square feet	Acres	\$1,000	Number	Square feet	Acres	\$1,000	
Northeast:	3,507	17,724,853	62,083	341,013	2,931	20,598,618	52,249	279,988
Connecticut	234	696,568	6,125	58,480	192	9,944,074	7,171	55,755
Maine	131	165,829	899	5,323	84	80,507	500	3,044
Massachusetts	255	509,749	2,707	26,696	244	518,082	2,502	24,317
New Hampshire	89	77,064	536	2,925	59	19,497	335	2,043
New Jersey	1,003	8,807,591	16,045	81,685	759	5,001,908	13,463	64,241
New York	704	1,205,359	14,533	69,469	593	1,236,833	10,770	52,455
Pennsylvania	930	5,828,663	19,110	83,264	900	3,411,109	15,505	66,132
Rhode Island	65	395,180	1,584	11,033	39	330,094	1,621	10,388
Vermont	96	38,850	544	2,138	61	56,514	382	1,613
Northcentral:	3,887	13,398,437	83,248	444,435	2,927	13,006,559	63,331	296,789
Illinois	513	1,314,613	19,236	93,375	363	760,255	13,584	59,147
Indiana	303	618,621	5,061	25,424	259	193,790	4,276	16,441
Iowa	181	359,969	3,054	17,821	123	308,350	3,159	13,599
Kansas	92	66,498	1,401	4,286	88	67,704	1,410	3,864
Michigan	834	3,367,325	18,160	103,660	662	7,104,974	12,176	75,248
Minnesota	312	1,190,002	7,967	42,783	210	344,850	3,035	15,368
Missouri	227	301,277	2,805	15,716	178	196,462	4,028	19,134
Nebraska	75	31,993	1,061	3,916	79	11,580	1,280	3,199
North Dakota	36	(D)	761	2,360	27	7,233	332	1,456
Ohio	882	5,782,694	17,121	102,541	632	3,685,242	14,161	66,196
South Dakota	32	67,375	494	5,554	34	12,275	647	1,602
Wisconsin	400	298,070	6,127	26,999	272	313,844	5,243	21,535
South:	8,416	52,012,282	126,743	918,086	6,340	44,148,326	98,274	674,680
Alabama	297	10,341,365	5,405	61,666	222	4,773,919	5,054	52,396
Arkansas	106	641,209	753	5,871	83	478,412	547	3,300
Delaware	43	40,100	824	4,265	35	114,272	765	4,451
Florida	2,519	15,471,322	28,552	309,090	1,964	16,822,250	18,871	226,965
Georgia	421	2,421,534	3,977	52,597	292	1,982,258	3,508	40,913
Kentucky	274	665,313	4,458	14,444	159	370,915	3,069	11,692
Louisiana	284	1,868,501	4,022	20,160	259	1,181,820	4,784	15,818
Maryland	326	1,449,106	7,319	43,935	253	527,722	6,170	27,049
Mississippi	132	855,559	934	7,288	99	606,021	582	5,330
North Carolina	1,193	3,093,284	13,782	73,884	923	2,447,885	8,132	44,949
Oklahoma	117	2,253,753	3,387	58,684	103	2,271,613	3,132	34,461
South Carolina	293	1,342,582	4,558	42,223	211	1,078,171	3,169	24,526
Tennessee	1,037	2,876,740	28,324	77,903	663	2,447,042	22,160	63,454
Texas	794	6,264,949	10,608	100,155	649	6,286,371	10,046	76,100
Virginia	484	2,270,258	9,265	42,773	354	2,498,305	7,876	40,394
West Virginia	96	156,707	575	3,148	71	261,350	409	2,882

West:	4,120	44,589,251	59,388	914,777	3,154	33,093,402	46,808	739,552
Alaska	30	23,886	97	473	19	9,300	66	430
Arizona	141	2,733,005	3,377	35,874	115	440,831	2,125	32,838
California	1,367	22,927,535	21,070	528,996	1,137	20,602,881	20,142	497,126
Colorado	160	368,231	1,743	21,637	131	372,548	1,426	13,663
Hawaii	307	1,286,653	616	13,290	196	1,598,034	392	7,056
Idaho	126	92,680	1,846	7,783	97	20,000	1,561	4,119
Montana	62	78,056	504	3,755	44	26,967	327	1,951
Nevada	13	(D)	47	298	9	12,900	12	324
New Mexico	87	215,312	736	4,829	67	1,052,045	829	6,064
Oregon	1,237	13,464,330	23,712	239,315	889	7,405,011	16,021	138,396
Utah	84	126,739	384	4,040	61	199,550	266	3,679
Washington	488	3,249,817	5,211	54,058	379	1,336,487	3,502	33,690
Wyoming	18	23,007	45	429	10	16,848	139	216
<u>United States</u>	<u>19,930</u>	<u>127,742,863</u>	<u>331,462</u>	<u>2,618,311</u>	<u>15,352</u>	<u>110,846,905</u>	<u>260,656</u>	<u>1,991,009</u>

(D) = Data are not published to avoid disclosure, but are included in U.S. totals.

Source: 1992 Census of Agriculture, Census Bureau, U.S. Dept. of Commerce.

This report examines those aspects of the nursery plant industry, focusing on in-ground production, that relate to the demand for crop insurance and the feasibility of developing an in-field nursery policy. State-level discussions and other information provided in the text are specific to in-ground nursery production, perils, and insurance issues.

Although the focus is largely on ornamental trees, shrubs, ground covers, and unfinished plants, the nursery crop classification includes an almost indefinite number of plants. A partial listing of plants, by scientific name (see Appendix table 13), illustrates the diversity of plants that are included in the field-grown nursery category.⁴

The Field-Grown Nursery Crop Market

Supply

The principal measure of production for nursery plants is value of sales. The wholesale value of U.S. nursery plant output is estimated at \$5.2 billion in 1994 and is anticipated to increase to \$6.5 billion by the year 2000.⁵ About one-half of this value represents in-field production.

The \$5.2 billion figure is higher than the Census figure of \$2.6 billion, as it is derived from USDA cash receipts and includes categories not included by the Census in the nursery crop category, such as seedlings, plugs, liners, and propagative materials. In addition, Census estimates are believed to be conservative, as some nurseries report as wholesale or retail operations, and not as farm operations. This is evidenced by the fact that some states report a larger number of registered, certified nurseries than are reported by the Census.

Imports account for a small, but growing, portion of U.S. nursery plant sales. The United States imported \$172 million in nursery products in 1993, up from

The American Nurseryman Publishing Company offers the following publications, which provide a more comprehensive listing of ornamental nursery plants and technical information on nursery crop production than is included in this report:

The American Horticultural Society Encyclopedia of Garden Plants, by Christopher Brickell and John Elsley; *The Encyclopedia of Ornamental Grasses*, by John Greenlee; *The Trees of North America*, by Alan Mitchell; *Manual of Herbaceous Ornamental Plants* (fourth edition), by Steven Still; *Encyclopedia of Perennials*, by Christopher Woods; *Diseases of Trees and Shrubs*, by Wayne A. Sinclair, Howard H. Lyon, and Warren T. Johnson; *Westcott's Plant Disease Handbook* (fifth edition), by Dr. Cynthia Westcott, revised by Dr. Kenneth Horst; *Diseases and Pests of Ornamental Plants* (fifth edition), by Pascal P. Pirone.

ERS estimate.

\$72 million in 1986. Imports amounted to 2 percent of the value of domestic production in 1986, and 3 percent in 1993. Propagative plants and young or starter plants account for the largest share of the import market. Most imported nursery plants are from Canada, but significant quantities also come from Mexico, Italy, Costa Rica, India, the Netherlands, the Philippines, and China.

Demand

U.S. purchases of nursery plants averaged about \$93 per person at the retail level in 1993, up from about \$63 in 1986. The principal purchasers of nursery plants are homeowners, builders, landscape contractors, grounds maintenance contractors, commercial businesses, retail nurseries, and garden centers. Smaller markets include highway departments, parks, golf course and other recreational facility managers, arboreta, and universities.

The demand for nursery crops is highly seasonal. An estimated 50-60 percent of the volume is sold during late winter through early summer, and 25-30 percent is sold in the fall. The remaining 10-25 percent is sold during the summer (Brooker and Turner).

Landscape contractors purchase an estimated 20-25 percent of nursery plant sales, while retail nurseries, garden centers, and other mass merchandisers account for about 55-60 percent. The remaining 15-25 percent of sales are grower-direct sales to consumers, sales through mail-order catalogues and re-wholesalers or brokers, and grower-direct sales to other entities (Brooker and Turner; Horticultural Research Institute, Inc.).

The demand for field-grown nursery crops is closely linked with residential and commercial building activity. Population growth, higher incomes, lower interest rates, and expanding business profits also are associated with strong demand for plants for landscaping.

The United States exported \$98.8 million in nursery products in 1993, up from \$9.4 million in 1986, excluding cut flowers and greens, potted foliage and flowering plants, bulbs, and seeds. Exports amounted to less than one-half percent of the value of domestic production in 1986, and to 2 percent of U.S. production value in 1993. The most significant export items in 1993 were trees and shrubs, fruit/nut trees, rose plants, rhododendrons/azaleas, and cuttings. Major export markets are Canada, the Netherlands, Germany, Mexico, and Japan.

Prices

USDA does not report prices for nursery products. However, a private company sells an analysis of regional plant wholesale prices through the *American Nurseryman*, a trade journal for growers, landscapers, and garden center retailers. The analysis is currently available only for northern Illinois, but publications for other regions are reportedly forthcoming and will target key market areas (American Nurserymen Publishing Company). The *American*

Nurseryman also contains a classifieds section, which lists species and wholesale prices for a variety of nursery plants.

The Field-Grown Nursery Crop Industry

Nursery Crop Types

Six broad categories of nursery crops compose the in-ground nursery and unfinished plants industry. The following section defines the six categories and lists a sampling of plants in each. A cross-reference between common names and scientific names for the major nursery plants is located in Appendix table 13.

Trees

Trees are the largest nursery crop category, by estimated value of sales (ERS estimate). Major sub-groups are shade and flowering trees, evergreen species, and fruit and nut trees. Generally, the shade and flowering trees are deciduous or "non-evergreen" species, such as oak, maple, dogwood, Bradford pear, and crabapple, which lose their leaves each year. Evergreen species, which retain their leaves throughout the year, include palm, spruce, fir, and pine. The fruits and nuts category includes both deciduous and tropical and subtropical types. Examples of deciduous fruit and nut trees include apple, peach, cherry, almond, pecan, and walnut. Subtropical fruit trees include avocado, orange, grapefruit, and lime. Most trees require a relatively long growing period in the nursery (up to 10 years or more) to reach marketable size.

Shrubs

Shrubs are the second-largest category of nursery crops by sales value. They consist of deciduous plants such as rose bushes, barberry, crape myrtle, hydrangea, spirea, flowering quince, viburnum, and lilac. Evergreen shrubs include hollies, azaleas, rhododendrons, yews, euonymus, and boxwood.

Ground Covers

Many perennial plants are included in the category of ground covers. Examples include spreading junipers, crownvetch, vinca, and English ivy.

Ornamental Grasses

Examples of ornamental grasses include pampas grass, Japanese blood grass, Indiangrass, Texas bluegrass, inland sea oats, and cordgrass.

Other Field-Grown Plants

Other field-grown nursery plants include vegetable transplants or sets (onion, tomato, celery, cauliflower, etc.); small fruit plants (strawberry, blueberry,

grapes, etc.); water lilies and other aquatic plants; and cacti, succulents, and other desert plants. Other field-grown plants include a wide range of herbaceous plants (such as hostas, ferns); perennial plants (such as peonia); and vines (such as wisteria).

Unfinished Plants and Propagative Materials

Unfinished plants refer to "liners" (young plants that are planted in rows or "lines") or small trees and plants (examples are plugs, seedlings, whips, and tissue culture plants). Although traditionally started in propagation-houses or field beds, liners are increasingly propagated by tissue-culture. Tissue-culture plants are grown in controlled laboratory environments and are sold as bare-root or lining-out stock. Young tissue-cultured plants are transplanted to containers or planted in a field nursery where they grow to marketable size. Propagative materials refer to cuttings and other plant parts sold for propagation purposes, grafting material, mother stock, or for growing-on.

Nursery Crop Production Areas

Every state produces nursery crops. Twelve states (California, Florida, Oregon, Illinois, Michigan, Ohio, New Jersey, New York, Pennsylvania, North Carolina, Tennessee, and Texas) each reported more than 10,000 acres of nursery crops in the open in 1992 (Table 1). Nineteen percent of the U.S. acreage in the open is located in the Northeast; 25 percent is in the North Central states; 38 percent is in the South, and 18 percent is in the West. The Census reported 377 U.S. counties with \$500,000 or more in sales of nursery crops in 1992 (Appendix table 1).

The location of in-field nursery production is largely determined by climate, distance to markets, and, sometimes, tradition. Each plant species has a hardiness zone which sets the northern limit for growing that type of plant.⁶ In addition to hardiness zone, other climatic conditions are important, such as rainfall, humidity, and heat.

The distance to market is more important for some types of plants than others. Small plants (seedlings and liners) and medium-sized plants (packaged roses) are shipped long distances, allowing nursery production to be located in areas with climatic, soil type, and cost advantages. A large packaged rose industry developed in the Pacific Northwest, for example, because the mild temperatures in that area are ideal for outdoor rose production.

On the other hand, large nursery plants tend to be produced near their final market. Trees are usually shipped no more than 300-500 miles from the nursery to the planting site. Usually, trees and other large plants are transported over shorter distances.

Hardiness zone numbers decline as one moves from south to north. Plants adapted to hardiness zone 3, for example, can withstand lower temperatures than those adapted to zone 6.

Finally, some nursery locations--particularly those that do not have a large, nearby market to supply--can be explained by tradition. Cultivation skills may be passed from generation to generation. Further, external economies of scale associated with input supplies or wholesale marketing may help explain some nursery locations.

Industry Characteristics⁷

The nursery industry is composed of a large number of small- and medium-sized firms that produce a small share of total output, and a small number of large firms that produce the bulk of industry output. Nursery crop sales generally account for the bulk of operators' incomes, but off-farm employment appears to be an important source of income for small nursery operators. Growers reduce production risks by producing different plant types with varying resistance to production perils.

Farms with Nursery Crop Sales

About 80 percent of the farms with nursery crops in 1987 reported less than \$100,000 in sales, and about 40 percent had sales of less than \$10,000 (Appendix tables 2a and 2b). Six percent of the farms had sales of \$500,000 or more.

Of the 15,352 farms with nursery crop sales in 1987, more than two-thirds were individual- or family-owned proprietorships (Appendix table 3). Ten percent were partnerships, 17 percent were family-held corporations, 3 percent were other than family-held corporations, and 1 percent were classified as "other." The individual- or family-owned category and partnerships tended to be small- to medium-size operations (with sales less than \$100,000), while corporate operations tend to be medium- to large-size businesses.

Although small- and medium-size operations accounted for the majority of the nurseries in 1987, larger operations accounted for most of the acreage and sales. The 79 percent of all nursery operations having less than \$100,000 in sales reported \$191.4 million (10 percent of the total) in nursery crop sales (Appendix table 4a). The 21 percent of operations with \$100,000 or more in sales, on the other hand, accounted for \$1.8 billion in nursery crop sales, about 90 percent of the total.

Income Diversification for Nursery Crop Farms

Less than one-half of nursery crop farms in 1987 reported that their principal occupation was farming (Appendix tables 5a and 5b), a finding that was fairly consistent across regions and states. Of the 15,352 nursery farm operators in

The statistical description of industry structure is based on tabulations of the 1987 Census of Agriculture for farms reporting sales of nursery crops. No comparable tabulations for farms with nursery crop sales in 1992 has been completed at the time this report was prepared.

1987, 40 percent reported they did not work off the farm, 20 percent reported 1-199 days of off-farm work, 35 percent reported 200 days or more of off-farm work, and 5 percent did not report. Most of the farms reporting work off the farm had agricultural sales of less than \$25,000. These data indicate that many nursery crop producers work part-time off the farm, providing a source of income diversification.

Crop Diversification

Farms with nursery crops tend to produce only nursery plants. Eighty percent of the crop receipts on nursery crop farms derive from the sale of nursery plants (Appendix table 4b). Total nursery/greenhouse receipts (nursery plants and other greenhouse/nursery items, such as cut flowers, bedding plants, potted plants, and turfgrass) accounted for \$2.26 billion out of \$2.54 billion in gross farm income in 1987 (Appendix tables 4a and 6).

Most medium- and large-size nurseries, and some smaller nurseries, produce a range of different plants, such as trees, shrubs, and ground covers. This diversification is a form of insurance against various production hazards. Freezes, insects, and diseases usually damage some species of plants more than others. Growers encountering such damage, consequently, usually lose only the susceptible species rather than their whole inventory.

Even nurseries that specialize in the production of a particular kind of plant can reduce risks by growing a number of different cultivars (varieties) with different tolerances to cold temperatures, insects, and diseases. A nursery specializing in azaleas and rhododendron, for example, may have plants with a wide range of plant shapes, blossom types, resistance to insects and diseases, cold tolerances, and other characteristics.

Cultivation and Management Practices

Climatic Requirements

Hardiness zones set the northern limit for growing a specific type of plant. Growers sometimes "stretch" these hardiness zones and produce plants further north than is recommended, either by careful management or by producing in a "warm" micro-climate within a zone. Some growers plant a crop in the spring that is not cold-hardy in a given zone, but remove it prior to the coldest winter weather. These crops are usually transplanted to containers and placed under protective cover until later sale or until the following year, when they can be transplanted back to the field. Hardiness zone information for common nursery plants is included in the appendix, while the "USDA Plant Hardiness Zone Map" is included as supplemental information.

Soil Requirements

The highest-quality nursery products usually are grown on clay-loam, silt-loam, or sandy-loam soils. Nursery crops can be grown, however, on a wide

range of soils if soil and nutrient amendments (fertilizers, lime, etc.) are added.

Soil drainage is important because poorly-drained soils result in weak plant growth due to oxygen starvation. Low-lying areas are subject to flooding and frost damage. Gently-sloping land with a grade of five percent or less is considered the best for good air flow, minimal erosion, and minimal field preparation problems.

Soil should be tested for nematodes before planting to nursery crops because excessive levels of soybean cyst, root-knot, or other species of nematode may cause stunting. In addition, an infested nursery crop can be quarantined and rendered unfit for sale. Once infected, nursery trees and plants cannot be effectively treated.

Soil fumigation controls nematodes as well as weeds, insects, and diseases. The expense of fumigation is usually justified by the increased value of the crop. Soil should also be checked for any significant herbicide residues from prior crop production.

Planting Practices

Most growers plant either purchased or self-propagated "liners" (young trees or plants) to be set or "lined-out" in rows in the field. Frequently, liners are planted in the field in the fall, giving the roots time for establishment before the plant breaks dormancy in the spring. Planting in the spring or early summer is also practiced.

Liners are small, bare-root trees and plants, or container-grown liners in pots or trays. Broadleaf shrubs and trees (holly, live oak, and magnolia) are often purchased as small container-grown liners. Although container-grown liners are more expensive than bare-rooted plants, there are fewer losses due to desiccation when transplanting. Broadleaf evergreens are particularly susceptible to loss if they are not container-grown. Unlike deciduous plants, broadleaf evergreens lose moisture through their leaves, even during the winter months.

Plants may be propagated in the fall and transplanted into small containers and placed in a greenhouse or cold frame to establish its root system during the winter. Planting may be by mechanical transplanters or by hand.

Liners are propagated by placing cuttings (small branches) from parent plants in the propagation area until roots develop. The roots are treated with growth hormones and fungicides and placed in a potting soil mix containing tree bark, sand, and/or peat moss that is enriched with calcium, magnesium, phosphorus, and micro-nutrients. A slow-release fertilizer is usually also incorporated into the mix.

Liner production usually requires 6 to 12 months for the roots to develop adequately and the plant to reach the needed size for planting in the field.

Liners may be transplanted into one-, two-, or three-gallon containers before planting in the field.

The spacing of trees and other nursery plants in the field depends upon the desired size at harvest, growth rates, cultivation, and harvesting equipment. Typically, plant spacing ranges from 3 x 3 feet for woody ornamentals to 12 x 12 feet or more for trees. Trees to be harvested at the three-inch, trunk-caliper size will need ample space to develop a desirable crown. A 6 x 10 spacing, which is common for many nursery trees, results in 726 trees per acre. Narrow, upright shrubs (such as yews) planted in a 3 x 3 area result in 4,840 plants per acre.

Some growers plant at twice the desired final density rate and harvest every other plant or row in subsequent years. This allows the remaining plants to grow to larger sizes. Growers may also increase the intensity of land use by inter-planting certain plants that require a longer growing period with ones that require a shorter period. A strict harvesting schedule must be followed or plant quality will decline due to overcrowding.

Fertilization

Soil should be tested before planting for nutrient requirements (phosphorus, potassium, calcium, magnesium, manganese, zinc) and nematodes. Fertilization needs vary, depending on soil type and the type and age of the plants. In general, rates are between 100-300 pounds of nitrogen per acre per year, 100-200 pounds of phosphorus, 250-450 pounds of potassium, 200-400 pounds of calcium, and 60-120 pounds of magnesium. The use of lime, which is applied to correct soil pH, also affects fertilization rates.

Generally, broadleaf evergreens (such as hollies) require the lowest levels of fertilizer, narrowleaf evergreens require somewhat more, and deciduous trees the highest levels. Clay soils require lower application rates because of their ability to hold nutrients. Sandy soils require the most frequent applications since fertilizer leaches from these soils more readily.

"Fertigation", or the practice of injecting or mixing fertilizer into the irrigation water, accelerates growth because the nutrients are concentrated beneath the tree and water is conserved. Fertigation also results in a more concentrated root mass and reduces weed growth. Fertigation has traditionally been a common practice for greenhouse- and container-grown plants. Presently, the practice is being extended to field-grown nursery crops.

Irrigation

Adequate amounts of good-quality water (pH in the 6.5 to 7.5 range and low in soluble salts) are needed for irrigation and freeze protection. Water also may be needed during the hottest parts of the summer to cool the trees and plants. Most growers use sprinkler irrigation for field-bed production and drip or mist-type irrigators for large trees and shrubs.

Plants may need to be irrigated daily when the temperature reaches 95° F - 100° F. Water requirements during the summer may be as high as 3 inches per acre per week. Depending upon plant size and kind, it is possible that 1 inch of water per day may be needed in hot, dry, windy weather.

Field-grown stock usually requires less exacting attention to irrigation than container-grown stock because the roots can draw water from a wider area. Nevertheless, irrigation timing and frequency can still be critical with certain kinds of plants, especially broadleaf evergreens.

Irrigation with well water is preferred to the use of surface water taken from ponds, lakes, or streams. Surface water may contain weed seeds, nematodes, algae, disease organisms, fertilizers, and herbicides. Some nurseries inject chlorine, a disinfectant, into the water supply while irrigating to control diseases and algae. The chlorinated water is not harmful to nursery plants.

Some water has a high mineral content, such as a high level of iron. Although such water does not physiologically harm the plants, it can discolor them and make them less attractive for sale.

Pruning

Pruning may be needed to obtain the desired final shape for the plant or tree. Improper pruning may result in poor quality and low prices. Not only does pruning improve the shape, it also enhances the rate of growth.

Usually only minimal pruning is needed at transplanting or during the first growing season. Most pruning is done during the second or third dormant season after transplanting.

Root pruning is a practice that helps concentrate the roots in the root ball and, thereby, lessens the stress on trees when they are dug at harvest-time. If root pruning is not performed, a substantial portion of the root system of larger trees may be lost in digging and transplanting.

Root pruning consists of running a disc-type blade vertically into the soil inside the area where the root ball will be dug. If the trees are to be planted in the fall, the roots are pruned during the previous spring or fall. Since drip irrigation and band fertilization tend to concentrate the root mass, some growers do not root prune trees when these practices are used.

Spraying

Profitable field production requires rapid, disease- and insect-free plant growth. Rapidly growing plants are more susceptible to diseases and pests, however, because of the abundance of tender foliage. Therefore, growers must have a good disease and insect detection and prevention program.

Generally, two methods are used for disease and insect control. The first method is based primarily on preventive spraying, which consists of regular

applications of fungicides, miticides, and other pesticides at prescribed intervals, especially during periods known to be optimum for specific pests and diseases. The interval and application rates are based upon chemical label recommendations and/or results from local trials. Fungicides are used predominantly in preventative spray programs, while insecticides are used as damage is observed.

The second method is integrated pest management (IPM), in which a pest problem is treated only when it threatens to reach an economic threshold. IPM involves regular plant examination to determine the level of infestation of pests and disease. Once a certain threshold of economic damage has been reached, a control program is initiated and continued until the threat is eliminated. Pest and disease populations can develop very rapidly, so growers must survey the crop area on a regular schedule. A missed threshold can result in severe infestation and crop loss.

Herbicides are used periodically by nursery crop growers to control annual and perennial weeds and grasses. Pre- and post-emergent herbicides that control perennial weeds are usually applied prior to planting. Later cultivation and herbicide applications are used to control annual weeds and grasses.

Harvesting Practices

The best time for harvesting (digging) to assure survival of the plant is from late fall to early spring. Plants can be dug at other times, but they must be given special post-digging care. Growers normally avoid harvesting during active shoot elongation because root regeneration is at its lowest point at this time. Field-grown trees and broadleaf evergreens are usually dug when they are dormant since there is less stress due to moisture transpiration. In recent years, however, summer and fall digging has become more commonplace, as anti-transpirants have become available that reduce water loss.

When plants are harvested with the soil and roots intact (that is, they are "balled and burlapped"), a tree spade is hydraulically forced into the ground around the tree, cutting side roots and the tap root. The entire soil ball, root system, and tree are lifted by the spades and moved over a burlap-lined wire basket. The root ball is placed into the basket, burlap is wrapped around the root ball, and the wire is tied tightly across the top to hold the soil and root together. The plant is then ready to be moved to the replanting site.

Root control bags or "gro-bags" are a recent innovation in field production of nursery stock. They combine the best qualities of both container and field production. The root control bag acts as a porous container which allows movement of water out of the bag to the surrounding soil, yet retains the roots inside the bag. It also provides greater protection from winter weather than if the plants were in containers. The bags must be removed when the tree or plant is installed in the landscape.

The use of gro-bags is somewhat limited in commercial nursery production, and it is considered to be an experimental practice. Gro-bag trees and shrubs are more expensive to establish, but cheaper to harvest since they can be lifted manually and mechanical harvesters are not required. A similar system that has been used by many growers is the production of plants in containers that are plunged into the ground and mulched with sawdust. This practice provides a very uniform arrangement of plants with adequate space and ease of harvest. Some disadvantages are that the plants can't be moved easily until harvest and roots may develop outside the container.

Another innovation is in-field "pot-in-pot" production. With this system, which is very similar to gro-bag production, the soil ball of the nursery stock is inside a pot or container, which is placed in a second pot in the ground. The advantage of pot-in-pot production is that the tree or plant can be lifted from the ground at harvest without any digging. The pots may be mulched to provide winter protection and protection from drought.

Most rhododendrons, azaleas, conifers, and large shade and ornamental trees must either be grown in containers or balled and burlapped. High mortality would result if these plants are harvested with bare roots due to the shock of harvesting and transplanting. Most fruit and nut trees, small fruit plants, grapevines, roses, deciduous shrubs, and seedlings, on the other hand, readily survive the shock of digging and transplanting as bare root plants. Normally, the roots are kept in contact with a moist sawdust mulch so they do not dry out during storage and shipping.

Marketing Practices

Some nursery growers sell strictly through their own retail outlets or combine landscaping services with nursery operations. Most operators, however, sell all or a part of their production to wholesale outlets, distributors, brokers, retail nurseries and garden centers, mass merchandisers (Walmart or K-Mart), and professional landscapers. The trend has been toward wholesale marketing, where larger quantities of nursery stock are sold to few buyers. Many small- and medium-size nursery growers sell exclusively to wholesalers, enabling them to concentrate on their production specialty and reducing their selling costs.

Some growers operate under contract for established nurseries. The established nursery may provide seeds, seedlings, or liners to the contract grower, and then buy back the plants at a predetermined price when they reach a marketable size. A number of growers in Tennessee are contract growers.

Other sales outlets include mail order, public gardens, golf courses, parks, arboreta, schools and colleges, and highway departments. An attached summary of a 1989 survey of nurserymen in 23 states provides additional information on marketing practices (Brooker and Turner). An industry-supported research summary, also attached, provides further marketing data (Horticultural Research Institute, Inc.).

Costs of Production

Field nursery stock production is a capital- and labor-intensive enterprise. Costs average \$5,000 to \$8,000 per acre for establishment and \$2,000 to \$4,000 per acre per year for operation. The investment in plants typically lasts at least 3-5 years, as many trees and shrubs require several years to reach marketable size.

The largest expense item in nursery production is hired and contract labor, accounting for about 40 percent of total expenses in 1987 (Appendix tables 7 - 10). Harvesting comprises an estimated one-third to one-half of the labor expense.

Appendix tables 11a - 11c present estimates of capital requirements, annual fixed costs, and total costs per saleable plant for two sizes of nurseries in climate zones 7 and 8. Appendix table 12 illustrates the costs and returns for establishing a 70-acre shade tree nursery over a 10-year period.

Production Perils

Major production perils include excessive rains, excessive heat, excessive wind, drought, freezing temperatures, and ice damage. Insects and diseases can generally be controlled through management practices. For plants that remain in the nursery field for an extended period (such as ornamental trees), damage may be out-grown and salability may be unaffected.

Excessive Rain

Above-normal rains can be tolerated by most in-ground nursery trees and plants for a short time, but flooding or soil saturation for several days can retard development and kill plants. The flooding that a plant can withstand depends on the species and time of year. Trees are most susceptible to damage early in the spring, when their respiration rate is highest. They can withstand a longer period of inundation during winter dormancy, when they are not actively growing.

Excessive rains can wash away soil, exposing tree and plant roots to drying or freeze damage. Generally, such exposure will kill the nursery stock or make it unsalable. In addition, heavy rains can delay digging of nursery stock, causing market losses or the inability to transfer the material to protective containers or greenhouse cover for winter protection.

Large quantities of water in nursery fields can loosen the plants, making them susceptible to damage from high winds. In the past several years, flooding in parts of the Southeast (particularly Florida, Georgia, Texas, Louisiana) and in the Mississippi and Ohio River Valleys has caused significant losses.

Excessive Heat

Excessive heat for an extended period of time causes wilting, slow growth, or harvest delays. Scorching of the leaves and increased insect activity often accompanies excessive heat, lowering quality levels and at times making plants unsalable. The effects of high temperatures can be mitigated to some extent by irrigation.

Drought

Drought reduces the rate of growth and can result in death from desiccation. Drought is less of a problem for growers who have irrigation than those who do not. Even those with irrigation systems, however, can experience drought losses if the water supply is depleted. Sudden, unexpected heat accompanied by dry weather can push the irrigation system beyond its capacity and cause equipment failure. Abundant water is critical for evergreens (broadleaf types are more susceptible than narrowleaf types to drought), seedlings, and liners. Deciduous trees can usually tolerate more drought than evergreens because they have more extensive root systems.

Excessive Wind

Winds of excessive force, such as those accompanying Hurricanes Andrew and Hugo, cause breakage and may dislodge plants and their roots from the soil. Excessive winds were cited as the most serious peril faced by nursery growers in south Florida.

Hail, Ice, and Snow

Excessive ice and snow can accumulate on trees and plants, causing breakage similar to that from excessive winds. Hailstorms can strip a tree or plant of most of its leaves and cause damage to trunks, rendering the nursery stock unusable or at least delaying marketing. Hail can kill young plants outright, causing total losses.

Freezing Temperatures

Very low temperatures can cause the bark of tree trunks to split, especially in the fall or spring when the plants have not hardened-off (acclimated to colder growing conditions) sufficiently. Trees and other plants are more susceptible to damage from sub-freezing temperatures when they are not fully dormant. Late spring frosts can kill the tips of new growth and buds (fruit, flower, foliage), and can slow growth and deform plants, reducing quality or making them unsalable.

Fire

Fire has caused some losses to nursery stock, particularly in California and other western areas prone to brush, grass, or forest fires. This can be a problem not only in populated areas, but also where isolated nursery fields

are adjacent to woodlots or forests. Fires are often started by lightning, but some are due to manmade causes such as arson or negligence.

Contaminated Water or Chemical Sources and Air Pollution

Water supplies may become contaminated from excessive soluble salts or salt water intrusion. Many plants can tolerate minor amounts of soluble salts, but excessive salts slow growth, diminish plant size, and may result in plant death.

Chemicals, unknowingly to growers, can contain harmful ingredients which may cause plant losses. Nursery growers in Florida and Georgia have filed claims against a chemical company for losses they allege were the result of using a contaminated pesticide.

Finally, air pollution may cause leaves to wilt and drop from the plant, and is a particular problem in urban areas.

Manmade Damage

Mechanical damage can occur because of the misuse of equipment or machinery. Miscalculation or misapplication of chemicals, fertilizers, pesticides, or herbicides can result in damage or total loss of trees and plants.

Diseases

A wide array of diseases can affect various species of nursery plants. Major diseases include: fungal diseases, blights, cankers, damping-off, rots, rusts, smuts, mildews, galls, mosaic, and chlorosis. Some diseases are spread by insects and nematodes. Some diseases are promoted by environmental conditions or poor cultural practices, such as mineral deficiencies or chemical injuries. Winter injury and injury from sudden changes in light intensity or temperature can also promote certain diseases.

Due to the vast number of different nursery trees and plants, and the large number of diseases attacking each, a detailed discussion is not included in this report.

Insects and Animal Pests

Nursery crops face a wide variety of insect pests, some of which are specific to one or several varieties and others which attack a number of plants. Major pests include: grasshoppers, June bugs, lace bugs, leafhoppers, whiteflies, aphids, mealybugs, scales, thrips, borers, and cutworms. Major animal pests include moles, mice, rabbits, deer, and birds.

State Analyses

Florida

The Census of Agriculture reported 2,519 farms in Florida with nursery crops in 1992, with \$309 million in sales. Dade, Broward, and Palm Beach counties, all in the southeast part of the state, reported the largest number of farms and the greatest acreage in nursery crops. Other counties with large nursery acreage were Hillsborough, Manatee, Pasco, and Pinellas in the Tampa area, and Orange and Lake in the Orlando area. Nearly every county, however, reported some farms growing nursery crops.

The Florida Department of Agriculture and Consumer Services reported 7,400 nurseries under inspection between July 1, 1993 and June 30, 1994. The vast majority of these (5,918) specialized in ornamental plants, including flowers and foliage plants. However, a substantial number produced both ornamental and fruit trees. Only a small minority of the inspected nurseries specialized in citrus, other fruits and nuts, or vegetable transplants.

Production Perils

The most serious production peril for in-ground nursery crops in Florida is damage from excessive winds. The most extreme wind damage is associated with hurricanes, such as Hurricane Andrew in 1992. Damage tends to be most severe in coastal counties where hurricane winds are the most intense. Hurricane winds tend to diminish as storms move inland. Other reported perils are sub-freezing temperatures, hail, and flooding.

A wide variety of insects and diseases attack nursery plants in Florida, but generally growers who follow recommended management practices can keep damage within acceptable levels.

Demand for Insurance

The greatest interest in an in-ground nursery insurance policy is likely to exist in Dade County, where severe losses in 1992 due to Hurricane Andrew raised growers' awareness to the need for insurance. Outside of Dade County, interest would likely be far more limited.

Except for growers in Dade County, participation in the containerized nursery policy, available since 1989, has been limited. Even in Dade County, the 26 policies covering \$7 million in liability written in 1992 represented a small share of the 770 registered nurseries in that county. Participation in the nursery policy increased in 1993 following losses caused by Hurricane Andrew. Insured liability in Dade County rose to \$30 million in 1993. In the counties other than Dade, only two or three nursery policies were written in each year between 1989 and 1993.

The President of the Dade County Chapter of the Florida Nurserymen and Growers Association indicated there have been discussions among the county's growers

concerning the need for field-grown nursery insurance (Gallant). According to Gallant, "Hurricane Andrew made growers aware of the need for crop insurance as part of good business management." He said that their association had not passed a resolution requesting that FCIC offer field-grown nursery insurance, but that he was sure that one would pass if brought before the Association's membership.

Gallant said that he would like to see an in-ground nursery policy similar to the containerized nursery policy. He indicated that catastrophic wind storm damage is the greatest production risk, and would be the peril against which most growers would want to insure. He said the containerized nursery policy permitted growers to opt out of freeze losses, and that he thought growers would want to opt out of freeze protection in a field-grown policy.

Ohio

The 1992 Census of Agriculture reported 882 nursery crop growers in Ohio with 17,121 acres in the open and nursery crop sales of \$102.5 million. Twenty-two counties had nursery crop sales of more than \$500,000. The top-ranked nursery counties in Ohio include Lake (\$42.1 million in sales), Clark (\$8.0 million), Warren (\$4.2 million), Franklin (\$3.0 million), and Montgomery (\$3.0 million).

Nurseries in Ohio are required to undergo certification and annual inspections (limited to winter-hardy trees and plants). A directory, issued by The Ohio Department of Agriculture, Division of Plant Industry, lists all certified nurseries. As of December 1, 1994, there were 1,153 licensed nursery stock producers and dealers in the state. An annual report is issued listing the kinds of trees and plants on which insect or disease problems have been found. No report is issued for healthy stock.

Production Perils

Ohio nursery growers confront a wide range of diseases and insects (Japanese beetles, gypsy moths, leafhoppers, and aphids). Severe drought and severe cold temperatures during the winter are the major weather-related production perils.

Demand for Insurance

The Executive Director of the Ohio Nursery and Landscape Association indicated that many Ohio growers would likely participate in at least the catastrophic coverage portion of an in-ground nursery policy, if it were offered (Stalter). He also indicated that most growers would "buy-up" to higher coverage levels.

Tennessee

The Census of Agriculture reported 1,037 nursery crop producers in Tennessee in 1992, with 28,324 acres of nursery acreage in the open. Nursery crop sales totaled \$77.9 million. Nine counties reported sales of more than \$500,000. The counties with the largest sales were Warren (\$38.6 million), De Kalb (\$9.6

million), Franklin (\$6.0 million), Grundy (\$5.0 million), Shelby (\$2.8 million), Coffee (\$2.6 million), and Knox (\$1.9 million).

Production Perils

According to the Executive Director of the Tennessee Nurserymen's Association, Warren, Franklin, and De Kalb counties, in the middle portion of the state, compose the major field-grown nursery area.

Drought is a more serious problem in Tennessee than flooding. Many of the in-ground nurseries do not have irrigation systems and are highly susceptible to drought losses. Although not a widespread occurrence, flooding periodically damages nursery plants in Tennessee (Evans). Nursery plants are occasionally damaged by severe-cold temperatures and occasionally by deer.

Some of the nurseries in the mid-portion of Tennessee have greenhouses in the western part of the state where they produce liner stock. Hail, ice, and snow damaged greenhouses in western Tennessee in 1994. As a consequence, in-field growers experienced a shortage of "lining-out" stock for planting.

Eastern Tennessee counties are mostly mountainous and have fewer nurseries than counties in other parts of the state. Nurseries in eastern Tennessee produce mostly rhododendrons, azaleas, Christmas trees, and other evergreens (Evans).

Demand for Insurance

The Secretary-Treasurer of the Tennessee Nurserymen's Association, who is also a nursery owner, indicated that he thought that nurserymen in Tennessee would participate in an in-ground nursery policy (Boyd). He said he would like to see the policy cover losses due to manmade damage as well as weather-related damage. He specifically cited losses due to chemical damage and losses due to employee negligence.

Texas

The Census of Agriculture reported 794 farms in Texas with 10,608 acres of nursery crops in the open in 1992. The sales value of nursery production was \$100 million. Smith and Van Zandt Counties reported the largest nursery crop sales, at \$8.8 and \$9.8 million, respectively. Thirteen counties had sales of \$500,000 or more.

The Texas Association of Nurserymen estimated wholesale grower sales at \$158 million in 1993. Although somewhat higher than the Census estimate, the nursery association's estimate likely includes the value of cut flowers and florist greens, which are excluded from the Census data presented in this report.

Production Perils

The major production peril for Texas nursery crop production is excessively cold temperatures (Edmondson). Other perils likely to cause significant losses include flooding, hail, and excessive wind. Excessive wind may be due to a hurricane along the Gulf coast or to tornados. In the Gulf Coast area, wind damage from hurricanes is a more serious peril than cold temperatures. Drought is not considered a major peril because most growers irrigate. Hail storms are more serious for some plants than for others. Foliage plants may sustain serious losses, while shrubs and trees can usually out-grow damage.

Demand for Insurance

The Executive Director of the Texas Association of Nurserymen indicated that there would be considerable interest in an in-ground nursery insurance policy, especially at the catastrophic level (Edmondson). He indicated that the Association was educating its members about the containerized policy and reminding them of the sign-up dates. He thought that one of the reasons for low participation in the containerized policy was that growers were not aware of the availability of insurance. He was unsure about growers' interest in participation in buy-up coverage.

Oregon

According to the Census of Agriculture, Oregon had 1,237 nursery crop growers with 23,712 acres in the open and \$239.3 million in nursery crop sales. Although there are 14 counties with more than \$500,000 in nursery crop sales, five counties account for a majority of the value of sales. These counties include Clackamas (\$60.7 million), Marion (\$48.6 million), Washington (\$46.5 million), Yamhill (\$45.7 million), and Multnomah (\$19.6 million).

Production Perils

According to a large nursery owner, the major production peril is a spring frost after the trees and plants have broken dormancy (Fessler). Sometimes, hail can damage leaf buds, but trees grow out of this damage. High winds in the Willamette Valley periodically cause breakage losses.

There is the potential for insect outbreaks to cause significant damage as Oregon's nurseries are located near forests and logging operations. All nursery stock and all nurseries are inspected annually, however, which reduces the chances of a potential infestation from going undetected.

Demand for Insurance

Currently, there are only 4 nursery operators who purchased the containerized nursery crop policy in Oregon. This is most likely because others are not aware of the policy. These operators are aware of the insurance only because they have other field crops and have frequent contact with the ASCS office.

It is believed that many growers would buy the policy if they were better informed about it's usefulness as a risk management tool (Fessler).

New Jersey

The Census of Agriculture reported 1,003 nursery crop growers in 1992 with 16,045 acres in the open and \$81.7 million in nursery crop sales. Fifteen counties in New Jersey had more than \$500,000 in sales. The top five counties in order of sales are: Monmouth (\$19.7 million), Burlington (\$15.8 million), Gloucester (\$8.0 million), Hunterdon (\$3.6 million), and Salem (\$3.4 million).

The Division of Plant Industries of the New Jersey Department of Agriculture conducts annual inspections and publishes the total acres of field-grown and container nursery stock, by county and by kind of plant/tree. Included in the annual report are the names and addresses of certified nursery growers. (The contact is Bob Balaam. He can be reached at 609-292-5441.)

Production Perils

The Executive Director of the New Jersey Nursery and Landscape Association indicated that snow and ice can cause damage to trees and plants during the winter by breaking limbs (Davis). Trees and plants may be unmarketable until they out-grow the damage. Frosts or freezes can be very damaging, especially in the spring if the trees and plants have started to foliate. Hail and flooding are typically very localized problems and occur less frequently and the damage is less severe than that caused by frost, snow, and ice.

Demand for Insurance

The Executive Director of the Nursery and Landscape Association indicated that he thought many growers would likely buy-up to higher protection than that provided by catastrophic coverage if an in-ground policy were offered. He thought they would buy the maximum protection to protect their high-value investment (Davis).

California

The Census of Agriculture reported 1,367 California nursery crop growers in California in 1992, with 21,070 acres in the open and \$529 million in total sales of nursery crops. California ranks well ahead of Florida in sales, but Florida has one-third more acres in the open and nearly twice as many growers as California.

Twenty-seven California counties had more than \$500,000 in grower sales of nursery crops in 1992. The top-producing counties, with more than \$10 million in sales, are Los Angeles (\$111.5 million), Orange (\$86.5 million), San Diego (\$62.5 million), Kern (\$50.1 million), Ventura (\$34.1 million), Stanislaus (\$21.3 million), Riverside (\$18.8 million), Sacramento (\$15.6 million), and Sonoma (\$13.0 million).

The field-grown nursery stock produced in California include fruit and nut trees, grapevines, citrus and avocado trees, rose bushes, caneberries, and strawberry plants. California is the number-one state for field-grown rose bush production. The state does not produce a large number of field-grown shade and ornamental trees. These trees, as well as broadleaf and narrowleaf evergreens, are usually container-grown in California.

Production Perils

According to the legislative affairs director of the California Association of Nurserymen, the major production threats are frosts and freezing weather. The largest losses were in 1991, when an estimated \$50 million in nursery stock was destroyed by freezing temperatures. Plants are most susceptible to freeze damage if cold weather occurs suddenly, before the plants have had a chance to harden-off. The most vulnerable areas to freeze losses are the coastal counties (Wick).

Other production perils are typically of much less importance. These perils include: flooding in the north coast counties (Napa and Sonoma); damage due to air pollution in Los Angeles, Orange, San Bernadino, and Riverside counties; and the potential shut-off of federal, state, or county irrigation district water supplies (Kern and Tulare). Fires, earthquakes, and high winds can also cause periodic production losses, but these were not viewed as major threats.

Demand for Insurance

The legislative affairs director for the California Association of Nurserymen thinks there will be very little interest in the field-grown policy outside of the coastal counties where freeze damage and flooding is the greatest threat. Growers in the inland counties reportedly do not face many serious production perils (Wick).

North Carolina

North Carolina has a large number of small- to medium-size nursery growers. The 1992 Agriculture Census reported 1,193 growers with 13,782 acres in the open and \$73.9 million in nursery crop sales. There are 25 counties with \$500,000 or more in nursery crop sales. The top ranking counties and their sales in 1992 are: Wake (\$5.9 million), Avery (\$4.7 million), Johnston (\$4.4 million), Caldwell (\$4.3 million), Guilford (\$4.1 million), and Burke (\$3.8 million). Henderson, Moore, and Pender counties each have \$2.0-\$2.3 million in sales. The North Carolina Department of Agriculture's "Certified Nurseries and Plant Collectors of North Carolina" lists 2,039 registered and certified nurseries for the year ending September 30, 1994.

Production Perils

Frosts, especially in the spring, can cause production losses to in-ground trees and plants. Heavy snows, hail, or freezing rains can also cause losses. High winds can periodically cause significant damage in the central and

eastern parts of the state, but losses are usually localized. The western counties in North Carolina are sometimes flooded because nurseries are in low-lying areas in the mountain valleys.

Demand for Insurance

The executive director of the North Carolina Association of Nurserymen indicated if the benefit/cost ratio of an in-ground nursery policy were similar to that of the current containerized policy, nurseries would be unlikely to purchase more than catastrophic coverage (Wilder). He indicated that some growers in the mountainous area would be interested in crop insurance because their nurseries are located in flood plains which are subject to periodic flooding and/or frosts. Growers in the Piedmont region are less likely to buy additional insurance because they have fewer production problems. There are not very many nursery growers east of the Piedmont region.

Ad Hoc Disaster Assistance for Nursery Crops

Ad hoc disaster assistance was made available for losses of commercially-grown crops for each of the years 1988-93. Ad hoc payments provide an indication of high-loss areas during that period, and may indicate states and counties that would face relatively high risk under an FCIC in-ground nursery policy. These data may also suggest areas where the demand for an in-ground nursery policy would be relatively high.

The data reported in this section include ad hoc payments for not only in-ground nursery crops, but also containerized plants. It is not possible to separate the two categories. The individual species listed in the ad hoc disaster assistance data were aggregated to represent the Census categories for "nursery crops" and "unfinished plants and propagative material."

Disaster assistance payments for nursery losses, using the categories listed in the previous paragraph, totaled nearly \$29.0 million over the 1988-93 period (Table 2). These ad hoc payments were scattered over a geographically broad area, with thirty states receiving payments in at least one of the six years. Regionally, the South was by far the largest recipient area.

In a ranking of states, Florida growers collected \$17.5 million in ad hoc disaster payments, the highest of any state, over the six-year period. A large share of these payments followed damage caused by Hurricane Andrew in 1992. Tennessee ranked second, with \$7.2 million in payments, followed by Alabama (\$1.1 million) and California (\$900,000). Although no other states collected over \$500,000 in total payments between 1988 and 1993, seven states received between \$100,000 and \$500,000.

Ad hoc disaster data can be used to indicate which states with large nursery crop industries received large payments relative to the state's sales (Tables 2 and 3). For example, the Census reported \$322.5 million in nursery crop

Table 2--Nursery crops and unfinished plants: Estimated value and disaster assistance payments, percent of crop value, by region and State, 1987

Region and State	Farms in 1992 reporting nursery crop sales		Farms in 1992 reporting unfinished plant sales		Total nursery crop and unfinished plant sales	Share of U.S.	Nursery disaster payments, 1988-93 2/	Disaster payments, percent of crop value
	Farms	Sales \$1,000	Farms	Sales \$1,000	\$1,000	Percent	Dollars	Percent
Northeast:	3,507	341,013	199	2,118	343,131	12.9	99,638	0.03
Connecticut	234	58,480	23	177	58,657	2.2	0	0.00
Maine	131	5,323	9	118	5,441	0.2	0	0.00
Massachusetts	255	26,696	24	285	26,981	1.0	0	0.00
New Hampshire	89	2,925	5	N/A	2,925	0.1	0	0.00
New Jersey	1,003	81,685	37	454	82,139	3.1	0	0.00
New York	704	69,469	46	550	70,019	2.6	0	0.00
Pennsylvania	930	83,264	40	472	83,736	3.1	98,225	0.12
Rhode Island	65	11,033	4	14	11,047	0.4	0	0.00
Vermont	96	2,138	11	48	2,186	0.1	1,413	0.06
Northcentral:	3,887	444,435	177	2,079	446,514	16.8	798,892	0.18
Illinois	513	93,375	24	346	93,721	3.5	278,644	0.30
Indiana	303	25,424	7	44	25,468	1.0	1,102	0.00
Iowa	181	17,821	10	225	18,046	0.7	705	0.00
Kansas	92	4,286	4	36	4,322	0.2	49,524	1.15
Michigan	834	103,660	31	N/A	103,660	3.9	217,603	0.21
Minnesota	312	42,783	20	N/A	42,783	1.6	2,207	0.01
Missouri	227	15,716	16	289	16,005	0.6	160,712	1.00
Nebraska	75	3,916	5	80	3,996	0.2	8,743	0.22
North Dakota	36	2,360	5	N/A	2,360	0.1	9,635	0.41
Ohio	882	102,541	31	595	103,136	3.9	36,472	0.04
South Dakota	32	5,554	N/A	N/A	5,554	0.2	0	0.00
Wisconsin	400	26,999	24	464	27,463	1.0	33,545	0.12
South:	8,416	918,086	550	20,130	938,216	35.3	26,750,430	2.85
Alabama	297	61,666	20	944	62,610	2.4	1,076,598	1.72
Arkansas	106	5,871	12	73	5,944	0.2	0	0.00
Delaware	43	4,265	4	N/A	4,265	0.2	0	0.00
Florida	2,519	309,090	153	13,460	322,550	12.1	17,497,916	5.42
Georgia	421	52,597	22	603	53,200	2.0	3,815	0.01
Kentucky	274	14,444	74	621	15,065	0.6	1,728	0.01
Louisiana	284	20,160	12	65	20,225	0.8	329,558	1.63
Maryland	326	43,935	12	N/A	43,935	1.7	0	0.00
Mississippi	132	7,288	13	167	7,455	0.3	178,492	2.39
North Carolina	1,193	73,884	85	1,562	75,446	2.8	315,198	0.42
Oklahoma	117	58,684	18	129	58,813	2.2	0	0.00
South Carolina	293	42,223	5	N/A	42,223	1.6	54,806	0.13
Tennessee	1,037	77,903	42	402	78,305	2.9	7,161,216	9.15
Texas	794	100,155	66	1,992	102,147	3.8	83,284	0.08
Virginia	484	42,773	8	88	42,861	1.6	47,819	0.11
West Virginia	96	3,148	4	24	3,172	0.1	0	0.00
West:	4,120	914,777	205	5,503	920,280	34.6	1,241,425	0.13
Alaska	30	473	N/A	N/A	473	0.0	0	0.00
Arizona	141	35,874	15	121	35,995	1.4	0	0.00
California	1,367	528,996	83	4,025	533,021	20.0	900,200	0.17

Colorado	160	21,637	13	438	22,075	0.8	35,078	0.16
Hawaii	307	13,290	8	271	13,561	0.5	22,846	0.17
Idaho	126	7,783	14	123	7,906	0.3	0	0.00
Montana	62	3,755	6	31	3,786	0.1	358	0.01
Nevada	13	298	3	N/A	298	0.0	0	0.00
New Mexico	87	4,829	13	145	4,974	0.2	0	0.00
Oregon	1,237	239,315	36	349	239,664	9.0	258,655	0.11
Utah	84	4,040	N/A	N/A	4,040	0.2	0	0.00
Washington	488	54,058	14	N/A	54,058	2.0	24,288	0.04
Wyoming	18	429	N/A	N/A	429	0.0	0	0.00
<u>United States</u>	<u>19,930</u>	<u>2,618,311</u>	<u>1,134</u>	<u>41,782</u>	<u>2,660,093</u>	<u>100.0</u>	<u>28,890,385</u>	<u>1.09</u>

N/A = Not available.

1/ Includes all payments made for any nursery crop grown, regardless whether grown under protection or in the open. No payments of any kind were made in 1988 and 1989.

Source: 1992 Census of Agriculture, Census Bureau, U.S. Dept. of Commerce and USDA/Economic Research Service.

sales in Florida in 1992, about 12 percent of the U.S. total, and the state accounted for about 9 percent of U.S. nursery area in the open. At the same time, Florida accounted for a relatively large share of U.S. ad hoc disaster payments. Florida's disaster payments accounted for about 60 percent of the U.S. total, and represented about 5 percent of the value of the Florida crop. Tennessee also realized large payments relative to its acreage and sales.

In contrast, California, New Jersey, and various north central states (such as Michigan and Illinois) collected a smaller share of ad hoc payments relative to their sales and acreage. For example, California accounted for nearly 20 percent of U.S. nursery crop sales in 1992, and over 6 percent of U.S. nursery acreage in the open, but collected about 3 percent of U.S. ad hoc payments for these crops over the 1988-93 period.

Disaster payments averaged 1.1 percent of U.S. nursery crop value over the 1988-93 period (Table 2). Disaster payments as a percent of crop value were highest in Tennessee (9.2 percent) and Florida (5.4 percent), and relatively low in California, New Jersey, Michigan, and Texas.

Table 3--Nursery crops and unfinished plants: Acreage and disaster assistance payment shares, by region and State, 1988-93

Region and State	Farms in 1992 reporting nursery crop sales		Farms in 1992 reporting unfinished plant sales		Total nursery crop and unfinished plant acreage in the open	Share of U.S.	Total nursery crop disaster payments, 1988-93 2/	Share of nursery disaster payments
	Farms	Acreage in the open	Farms	Acreage in the open				
	Number	Acres	Number	Acres				
Northeast:	3,507	62,083	199	202	62,285	18.7	99,638	0.3
Connecticut	234	6,125	23	N/A	6,125	1.8	0	0.0
Maine	131	899	9	N/A	899	0.3	0	0.0
Massachusetts	255	2,707	24	6	2,713	0.8	0	0.0
New Hampshire	89	536	5	N/A	536	0.2	0	0.0
New Jersey	1,003	16,045	37	79	16,124	4.8	0	0.0
New York	704	14,533	46	33	14,566	4.4	0	0.0
Pennsylvania	930	19,110	40	78	19,188	5.8	98,225	0.3
Rhode Island	65	1,584	4	N/A	1,584	0.5	0	0.0
Vermont	96	544	11	6	550	0.2	1,413	0.0
Northcentral:	3,887	83,248	177	213	83,461	25.0	798,892	2.8
Illinois	513	19,236	24	N/A	19,236	5.8	278,644	1.0
Indiana	303	5,061	7	N/A	5,061	1.5	1,102	0.0
Iowa	181	3,054	10	N/A	3,054	0.9	705	0.0
Kansas	92	1,401	4	N/A	1,401	0.4	49,524	0.2
Michigan	834	18,160	31	118	18,278	5.5	217,603	0.8
Minnesota	312	7,967	20	18	7,985	2.4	2,207	0.0
Missouri	227	2,805	16	21	2,826	0.8	160,712	0.6
Nebraska	75	1,061	5	15	1,076	0.3	8,743	0.0
North Dakota	36	761	5	N/A	761	0.2	9,635	0.0
Ohio	882	17,121	31	41	17,162	5.1	36,472	0.1
South Dakota	32	494	N/A	N/A	494	0.1	0	0.0
Wisconsin	400	6,127	24	N/A	6,127	1.8	33,545	0.1
South:	8,416	126,743	550	1,059	127,802	38.3	26,750,430	92.6
Alabama	297	5,405	20	26	5,431	1.6	1,076,598	3.7
Arkansas	106	753	12	N/A	753	0.2	0	0.0
Delaware	43	824	4	N/A	824	0.2	0	0.0
Florida	2,519	28,552	153	442	28,994	8.7	17,497,916	60.6
Georgia	421	3,977	22	50	4,027	1.2	3,815	0.0
Kentucky	274	4,458	74	N/A	4,458	1.3	1,728	0.0
Louisiana	284	4,022	12	13	4,035	1.2	329,558	1.1
Maryland	326	7,319	12	17	7,336	2.2	0	0.0
Mississippi	132	934	13	15	949	0.3	178,492	0.6
North Carolina	1,193	13,782	85	134	13,916	4.2	315,198	1.1
Oklahoma	117	3,387	18	23	3,410	1.0	0	0.0
South Carolina	293	4,558	5	N/A	4,558	1.4	54,806	0.2
Tennessee	1,037	28,324	42	69	28,393	8.5	7,161,425	24.8
Texas	794	10,608	66	270	10,878	3.3	83,284	0.3

Virginia	484	9,265	8	N/A	9,265	2.8	47,819	0.2
West Virginia	96	575	4	N/A	575	0.2	0	0.0
West:	4,120	59,388	205	226	59,614	17.9	1,241,425	4.3
Alaska	30	97	N/A	N/A	97	0.0	0	0.0
Arizona	141	3,377	15	N/A	3,377	1.0	0	0.0
California	1,367	21,070	83	131	21,201	6.4	900,200	3.1
Colorado	160	1,743	13	N/A	1,743	0.5	35,078	0.1
Hawaii	307	616	8	N/A	616	0.2	22,846	0.1
Idaho	126	1,846	14	43	1,889	0.6	0	0.0
Montana	62	504	6	N/A	504	0.2	358	0.0
Nevada	13	47	3	N/A	47	0.0	0	0.0
New Mexico	87	736	13	15	751	0.2	0	0.0
Oregon	1,237	23,712	36	23	23,735	7.1	258,655	0.9
Utah	84	384	N/A	N/A	384	0.1	0	0.0
Washington	488	5,211	14	14	5,225	1.6	24,288	0.1
Wyoming	18	45	N/A	N/A	45	0.0	0	0.0
<u>United States</u>	<u>19,930</u>	<u>331,462</u>	<u>1,134</u>	<u>2,126</u>	<u>333,588</u>	<u>100.0</u>	<u>28,890,385</u>	<u>100.0</u>

N/A = Not available.

1/ Includes all payments made for any nursery crop grown, regardless whether grown under protection or in the open. No payments of any kind were made in 1988 and 1989.

Source: 1992 Census of Agriculture, Census Bureau, U.S. Dept. of Commerce and USDA/Economic Research Service.

Field-Grown Nursery Crop Insurance Implementation Issues

Adverse Selection

Adverse selection, the tendency for growers to buy an insurance policy who represent higher risk than is reflected in the premium they pay, is not likely to be any more of an issue for in-field nursery than with other crops. The primary opportunities for adverse selection are likely to be associated with nurseries which are subject to losses due to flooding, frosts, or freezes. Growers with nurseries located in low-lying areas subject to flooding may be more likely to buy insurance than growers with nurseries located at higher elevations where flooding is less of a peril. Florida has a number of areas where the land is flat and the ground water level may remain at or above the soil line for extended periods. Several low-lying nursery operations in the Mississippi River Valley and its tributaries experienced losses in 1993 due to extended flooding.

As nurseries located in flood-plains are more prone to losses due to flooding, nurseries located in "cold pockets" are more likely to experience losses due to frost or freeze damage. Cold pockets are areas, usually low-lying and with poor air drainage, where night-time temperatures drop below those in nearby surrounding areas. Growers with nurseries located in cold pockets may be more likely to purchase insurance than those with nurseries located in areas less prone to frost or freeze damage.

Losses from hail, drought, and wind storms are not likely to be associated with adverse selection. All nurseries within a defined area, such as a county, are more or less equally prone to losses from these perils.

Setting Reference Prices

The approach used for assigning value in the containerized nursery policy should be a workable procedure for valuing production for an in-field policy. In the containerized policy, growers provide FCIC with their wholesale price list, which serves as the basis for determining market value for the insured crop. Using individual growers' wholesale price lists is probably unavoidable because wholesale nursery plant prices are generally not available. This situation may change in the future as the American Nurseryman magazine plans to publish a series of regional wholesale price analyses for nursery plants (see the "Prices" section of this report).

An in-field value represents the most appropriate method for appraising the value of production losses because it avoids reimbursing growers for non-incurred expenses for harvesting and selling. Harvesting and marketing expenses, such as digging, packing, shipping, and sales commissions, account for an estimated 40 to 60 percent of total production costs (ERS estimate based on discussions with industry contacts). One contact indicated that in Tennessee, the in-field value of nursery plants was about 40 percent of the wholesale prices listed in the sales catalogues of the major growers (Evans).

One procedure for estimating an in-field valuation would be to subtract an allowance for harvesting and selling expenses from the grower's wholesale prices. A second method would be to base the in-field value on estimated cost of production (exclusive of harvesting and marketing expenses). A third approach, of course, is to use a rule-of-thumb guide, such as 50 percent of the grower's average wholesale price.

Estimating Production History

"Actual production history" in terms of production per unit of area (an acre, for example) does not have the relevance for insuring nursery plants that it does for other crops. One reason is that a nursery policy generally covers a number of different species of plants, while policies for other crops cover only one species. Production per unit of area may be different for each species in the nursery policy, while a standard unit of measure suffices for the entire production covered by policies for other crops.

Another reason that yields do not have the same significance for nursery crops as other crops is that nursery crops do not have an explicit production cycle. With field crops, for example, there are established planting dates, followed by a growing phase and a harvest period, usually all within a growing season. With nursery crops, on the other hand, especially ornamental trees, the growing period may be indefinite, extending from a year or two to as long as 5 or 10 years or even longer. Harvesting dates also may be uncertain, frequently occurring only after a buyer has been found.

A more plausible method for estimating production for an in-ground nursery policy is to base it on a plant count or value of sales. For some species, the tally may be an estimate based on area and average plant density, while for others it may be an actual count.

Estimating the "Value of the Damaged Crop"

Nursery plants may retain partial value after weather-related damage. Unless a damaged plant is killed outright, it may outgrow its injury and become salable at a future time. This is particularly the case with frost and wind damage, where plants sustain injury, but are not killed. With pruning and an additional growing period, the injured plants often outgrow their blemishes and become fully marketable. If indemnity payments were made for plants incurring temporary damage, the opportunity would arise for growers to receive double payments on damaged plants. They could receive a payment immediately from a crop insurance indemnity, and later, from market sales.

One approach to appraising a plant's remaining value is to compute the net present value for the expenses and future in-field returns once the injured plant reaches salable condition. This approach accounts for the additional expenses (for labor, fertilizer, water, etc.) needed to bring the plant to a salable condition. It also accounts for any increases or decreases in the plant's field value following the injury. Taking into account the changes in in-field values is important because some plants may be larger by the time

they reach marketable condition and have a higher in-field value than prior to injury.

From an operational standpoint, it may be necessary to develop a rule-of-thumb guide for estimating the remaining value of damaged plants. The current containerized nursery policy uses a 90-percent rule to estimate the remaining value of damaged plants.

Market Prices and Moral Hazard

Moral hazard due to low market prices is not expected to be an issue with in-ground nursery crops in well-managed commercial nurseries. The reason is that nurseryman usually are not faced with an uncompromising deadline for marketing their plants. This differs from perishable commodities, such as fresh fruits and vegetables, where growers must find a buyer offering an acceptable price during the short period of time when their commodity is ready to sell. If a buyer is not found, growers of perishable crops may lose their investment in the crop, while nurserymen can usually hold plants in their inventory until they find a buyer. This need to find a buyer at a specific time makes an insurance indemnity at times appear to be an attractive option and creates an incentive for moral hazard for perishable crops.

Because nursery crop growers can keep plants in the nursery for extended periods (several years), they are under less pressure to harvest on a specific date than growers of perishable commodities. In fact, some nursery plants, such as ornamental trees, increase in value as they continue to grow and increase in size. Nursery producers, consequently, are less likely than perishable-commodity producers to encounter situations where collecting an insurance indemnity becomes a profitable option to economic abandonment.

Availability of Plant Inventories

Production losses among nursery crops will likely have to be measured in terms of reduced inventories of salable plants rather than reduced yields. Most well-managed nurseries have their own projections of plant inventories, but with few exceptions, such inventories are not publicly available. One notable exception is in Florida, where the Bureau of Plant Inspection conducts a plant count on each registered nursery at least once each year (Clark). These counts, which are publicly available, serve as the basis for determining a nursery's registration fee.

Requiring State Registration

Generally, state laws require commercial nursery producers to register their nurseries and have their plants inspected for insects, diseases, and weeds. Some states require licensing in order for growers to sell nursery stock. Despite these regulations, some nursery operators reportedly fail to register their operations and have them inspected.

Prior to participation in an insurance policy, FCIC might consider requiring nurseries to satisfy state licensing and inspection requirements. Inspectors

provide a service to the industry by facilitating high quality standards for plants. For individual growers, inspectors reduce the chances of serious pest outbreaks by pointing out potential problems before they get out of control. Many states have reciprocal inspection agreements for nursery stock that is shipped interstate.

Demand for Insurance

Our assessment is that, with few exceptions, participation in crop insurance for in-ground nursery plants would be concentrated at the minimum catastrophic coverage level. For a very small cost, producers are able to receive coverage from the most serious, catastrophic events. Generally, growers report that they are able to deal with the production perils encountered in nursery crop production. Insects and diseases can be kept in check with proper management, including the use of pesticides. Interest in "buy-up" coverage appears to vary widely from state to state, with the greatest participation likely to occur in southeast Florida, and the Gulf Coast areas of Florida, Alabama, Mississippi, Louisiana, and Texas.

Growers located in flood and freeze prone areas may be especially inclined to participate in the buy-up option. Although frosts and freezes may damage nursery plants, losses usually are confined to that part of the inventory which is vulnerable to cold temperatures. Frequently, losses can be minimized by further caring for damaged plants and selling them after they have out-grown their injuries.

Nurseries located in areas subject to full-strength hurricane winds may also be especially interested in coverage, particularly at the buy-up levels. Such nurseries are likely to be located in southeast Florida, and in Florida, Alabama, Mississippi, Louisiana, and Texas counties adjacent to the Gulf of Mexico. Participation in the containerized nursery policy is concentrated in Dade and Palm Beach Counties in Southeast Florida. Participation in Dade County rose sharply during 1993 and 1994, following severe losses caused by Hurricane Andrew.

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Appendix table 1a--Floriculture crops: Farms, acreage, and sales, by region and State, 1992 and 1987

		1992				1987	
Region Acreage and in the State open	Sales	Farms	Area under glass or other protection	Acreage in the open	Sales	Farms	Area under glass or other protection
		Number	Square feet	Acres	\$1,000	Number	Square feet
Acres	\$1,000						
Northeast:							
Connecticut		418	6,317,233	195	39,876	(NA)	(NA)
(NA)	(NA)						
Maine		447	2,335,667	241	13,835	(NA)	(NA)
(NA)	(NA)						
Massachusetts		691	9,713,079	568	57,387	(NA)	(NA)
(NA)	(NA)						
New Hampshire		240	2,627,996	115	19,662	(NA)	(NA)
(NA)	(NA)						
New Jersey		863	15,746,201	2,322	86,571	(NA)	(NA)
(NA)	(NA)						
New York		1,358	22,316,021	818	128,803	(NA)	(NA)
(NA)	(NA)						
Pennsylvania		1,174	20,486,026	794	120,441	(NA)	(NA)
(NA)	(NA)						
Rhode Island		81	751,312	39	2,850	(NA)	(NA)
(NA)	(NA)						
Vermont		214	1,129,301	124	6,222	(NA)	(NA)
(NA)	(NA)						
North Central:							
Illinois		507	9,695,250	1,637	66,208	(NA)	(NA)
(NA)	(NA)						
Indiana		502	9,932,914	472	48,374	(NA)	(NA)
(NA)	(NA)						
Iowa		311	5,261,423	68	33,545	(NA)	(NA)
(NA)	(NA)						
Kansas		199	4,252,292	112	22,841	(NA)	(NA)
(NA)	(NA)						
Michigan		1,067	33,236,191	2,979	176,687	(NA)	(NA)
(NA)	(NA)						
Minnesota		442	8,952,521	347	50,157	(NA)	(NA)
(NA)	(NA)						
Missouri		420	6,981,961	164	39,580	(NA)	(NA)
(NA)	(NA)						

Nebraska	126	1,457,307	57	7,805	(NA)	(NA)
(NA) (NA)						
North Dakota	76	598,728	37	4,132	(NA)	(NA)
(NA) (NA)						
Ohio	1,099	28,779,385	544	154,568	(NA)	(NA)
(NA) (NA)						
South Dakota	58	1,250,669	4	7,003	(NA)	(NA)
(NA) (NA)						
Wisconsin	539	7,797,860	299	48,624	(NA)	(NA)
(NA) (NA)						
South:						
Alabama	342	8,521,108	369	50,032	(NA)	(NA)
(NA) (NA)						
Arkansas	196	2,197,301	165	9,946	(NA)	(NA)
(NA) (NA)						
Delaware	61	2,149,548	71	11,434	(NA)	(NA)
(NA) (NA)						
Florida	2,741	155,208,356	17,555	571,346	(NA)	(NA)
(NA) (NA)						
Georgia	579	7,960,504	1,507	48,274	(NA)	(NA)
(NA) (NA)						
Kentucky	424	4,478,805	256	21,815	(NA)	(NA)
(NA) (NA)						
Louisiana	283	3,895,073	263	21,710	(NA)	(NA)
(NA) (NA)						
Maryland	454	6,082,768	675	34,851	(NA)	(NA)
(NA) (NA)						
Mississippi	204	3,386,487	169	15,110	(NA)	(NA)
(NA) (NA)						
North Carolina	801	17,751,193	1,111	99,094	(NA)	(NA)
(NA) (NA)						
Oklahoma	263	3,435,039	85	16,912	(NA)	(NA)
(NA) (NA)						
South Carolina	308	2,983,264	358	20,033	(NA)	(NA)
(NA) (NA)						
Tennessee	562	6,790,285	637	28,913	(NA)	(NA)
(NA) (NA)						
Texas	899	29,631,007	2,606	180,621	(NA)	(NA)
(NA) (NA)						
Virginia	574	7,083,604	586	50,780	(NA)	(NA)
(NA) (NA)						
West Virginia	175	1,777,570	28	9,077	(NA)	(NA)
(NA) (NA)						
West:						
Alaska	56	8,521,108	369	50,032	(NA)	(NA)
(NA) (NA)						
Arizona	97	2,607,002	530	18,845	(NA)	(NA)
(NA) (NA)						
California	2,210	123,585,700	15,299	797,098	(NA)	(NA)
(NA) (NA)						

Colorado	265	10,562,838	136	66,197	(NA)	(NA)
(NA) (NA)						
Hawaii	1,352	23,638,983	2,718	66,261	(NA)	(NA)
(NA) (NA)						
Idaho	107	1,158,910	81	7,332	(NA)	(NA)
(NA) (NA)						
Montana	119	1,132,803	78	6,452	(NA)	(NA)
(NA) (NA)						
Nevada	15	179,223	(D)	(D)	(NA)	(NA)
(NA) (NA)						
New Mexico	109	3,141,939	60	19,308	(NA)	(NA)
(NA) (NA)						
Oregon	774	12,235,601	1,336	66,697	(NA)	(NA)
(NA) (NA)						
Utah	109	3,540,065	31	19,971	(NA)	(NA)
(NA) (NA)						
Washington	532	10,129,801	1,928	78,064	(NA)	(NA)
(NA) (NA)						
Wyoming	34	252,718	(D)	1,630	(NA)	(NA)
(NA) (NA)						
United States	25,477	655,853,141	61,106	3,482,782	(NA)	(NA)
(NA) (NA)						

(D) = Data are not published to avoid disclosure, but are included in U.S. totals.

(NA) = Not available.

Source: 1992 Census of Agriculture.

Appendix table 1b--Foliage plants: Farms, acreage, and sales, by region and State, 1992 and 1987

Region and State	1992				1987			
	Farms	Area under glass or other protection	Acreage in the open	Sales	Farms	Area under glass or other protection	Acreage in the open	Sales
	Number	Square feet	Acres	\$1,000	Number	Square feet	Acres	\$1,000
Northeast:	638	4,392,008	477	33,611	636	4,757,571	415	35,131
Connecticut	42	294,734	14	4,210	36	199,208	12	2,030
Maine	37	95,088	29	730	35	74,875	4	489
Massachusetts	73	531,280	13	2,680	66	536,480	26	3,727
New Hampshire	19	162,060	26	1,340	22	142,219	0	1,288
New Jersey	123	1,623,939	120	11,480	108	1,550,797	112	10,940
New York	170	630,443	59	4,437	187	997,750	122	6,489
Pennsylvania	151	981,530	214	8,533	160	1,230,336	133	9,932
Rhode Island	4	14,334	(D)	38	8	9,510	6	104
Vermont	19	58,600	2	163	14	16,396	0	132
Northcentral:	647	4,183,185	290	41,893	586	6,068,480	549	45,976
Illinois	86	679,069	115	6,221	77	660,459	89	5,912
Indiana	60	309,483	14	3,448	55	345,114	46	3,372
Iowa	46	219,299	(D)	1,801	34	232,247	0	2,310
Kansas	33	237,996	27	1,392	31	324,521	0	2,580
Michigan	95	747	66	5,778	89	681,061	111	5,569
Minnesota	46	290,550	6	2,065	34	257,894	0	1,953
Missouri	61	367,270	7	2,724	57	393,523	0	3,347
Nebraska	16	35,589	5	201	13	26,040	0	146
North Dakota	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Ohio	147	1,536,317	40	13,041	135	2,184,458	220	16,140
South Dakota	6	(D)	(NA)	(D)	9	(D)	(NA)	(D)
Wisconsin	51	506,865	10	5,222	52	963,163	83	4,647
South:	3,073	119,508,524	7,408	390,258	2,953	113,870,687	7,324	351,095
Alabama	101	1,135,724	55	6,537	116	994,962	96	4,391
Arkansas	38	306,113	2	1,810	25	162,181	20	1,214
Delaware	13	185,605	18	1,562	5	22,266	0	0
Florida	1,631	100,210,335	5,262	297,391	1,625	97,932,470	5,265	280,283
Georgia	178	822,165	137	5,063	119	684,006	97	4,861
Kentucky	55	335,800	39	2,060	29	185,150	0	952
Louisiana	117	1,118,496	99	5,199	127	970,876	122	3,980
Maryland	52	298,083	(D)	2,578	56	715,953	126	4,736
Mississippi	67	317,250	18	1,401	58	410,722	51	1,826
North Carolina	166	3,149,922	115	14,505	140	1,232,609	81	6,626
Oklahoma	56	654,056	33	3,785	50	484,187	15	3,268
South Carolina	85	387,107	84	2,838	55	320,344	34	1,670
Tennessee	113	497,518	205	2,659	92	771,543	187	3,843
Texas	308	9,561,950	1,298	38,074	373	8,330,494	1,148	29,454
Virginia	82	471,777	43	4,003	70	386,697	82	2,946
West Virginia	11	56,623	(D)	793	13	266,227	0	1,045

West:	1,020	21,709,603	2,085	155,608	970	27,085,700	3,327	165,892
Alaska	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Arizona	33	596,510	37	4,371	43	762,404	102	7,468
California	441	14,920,281	1,000	118,813	518	18,649,499	2,155	128,594
Colorado	37	523,957	(D)	5,222	31	919,794	4	4,671
Hawaii	268	4,366,328	898	15,853	191	4,880,244	449	12,621
Idaho	7	10,270	(D)	65	7	0	0	94
Montana	16	100,150	2	493	10	36,700	0	296
Nevada	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
New Mexico	23	(D)	(D)	1,461	23	368,227	(D)	(D)
Oregon	100	458,650	104	4,232	62	249,554	213	2,390
Utah	16	(D)	(D)	(D)	15	470,567	(D)	3,404
Washington	79	733,457	44	5,098	70	748,711	404	6,354
Wyoming	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
United States	5,383	150,996,176	10,418	623,256	5,155	151,991,947	11,664	603,174

(D) = Data are not published to avoid disclosure, but are included in U.S. totals.

(NA) = Not available.

Source: 1992 Census of Agriculture.

Appendix table 1c--Potted flowering plants: Farms, acreage, and sales, by region and State, 1992 and 1987

State	1992				1987			
	Farms	Area under glass or other protection	Acreage in the open	Sales	Farms	Area under glass or other protection	Acreage in the open	Sales
	Number	Square feet	Acres	\$1,000	Number	Square feet	Acres	\$1,000
Northeast:	1,908	25,891,752	1,194	163,914	1,844	24,954,540	871	137,674
Connecticut	159	1,375,502	47	10,117	131	1,549,456	55	11,394
Maine	100	481,579	33	2,977	83	324,213	20	2,441
Massachusetts	257	2,927,749	120	20,878	240	3,135,602	99	21,059
New Hampshire	68	524,687	15	5,932	58	367,984	0	2,460
New Jersey	323	6,065,003	714	32,892	287	5,466,891	201	32,563
New York	451	7,730,568	138	52,420	486	8,517,230	106	37,420
Pennsylvania	480	6,363,359	109	36,551	493	5,362,406	386	29,078
Rhode Island	20	193,444	(D)	745	21	139,433	0	874
Vermont	50	229,861	18	1,402	45	91,325	4	385
Northcentral:	1,736	30,045,532	858	182,403	1,482	24,371,716	504	132,661
Illinois	160	3,141,533	419	26,874	177	3,132,416	123	17,464
Indiana	180	2,365,643	60	10,931	135	1,778,774	37	6,872
Iowa	80	1,402,800	(D)	11,225	67	1,379,224	0	7,338
Kansas	63	1,440,497	19	7,324	58	1,203,310	0	6,622
Michigan	350	6,965,771	146	41,799	299	5,141,721	223	28,302
Minnesota	128	2,059,639	17	12,799	101	1,587,198	0	8,865
Missouri	156	2,164,075	52	15,039	121	2,051,448	0	15,186
Nebraska	42	302,580	9	1,400	31	175,508	0	901
North Dakota	10	(D)	(NA)	(D)	8	(D)	(D)	(D)
Ohio	389	7,980,131	113	45,270	333	5,884,099	70	30,476
South Dakota	13	233,016	(D)	1,085	15	0	0	0
Wisconsin	165	1,989,847	23	8,657	137	2,038,018	51	10,635
South:	2,578	48,941,935	1,751	270,200	2,061	40,910,245	1,428	211,112
Alabama	136	2,291,053	120	11,910	101	1,916,593	145	14,879
Arkansas	65	422,276	10	1,828	48	433,586	5	1,517
Delaware	30	1,154,475	35	5,902	28	308,141	29	0
Florida	524	17,179,550	468	79,184	428	10,886,536	382	57,782
Georgia	218	2,618,175	187	16,247	135	2,248,483	42	11,541
Kentucky	103	807,903	21	4,214	62	659,821	13	3,450
Louisiana	94	1,050,352	28	5,071	83	733,032	45	3,734
Maryland	161	2,045,546	61	9,854	138	1,898,109	198	8,943
Mississippi	68	1,061,913	43	5,712	51	814,637	9	3,745
North Carolina	286	6,754,331	288	43,753	248	5,489,274	216	28,842
Oklahoma	70	819,019	5	3,364	67	849,462	11	4,304
South Carolina	107	1,180,897	91	9,492	77	1,218,583	23	8,023
Tennessee	178	2,328,057	134	8,322	117	1,975,763	160	9,314
Texas	282	6,327,022	193	43,428	291	8,803,156	103	43,093
Virginia	210	2,371,454	66	18,415	152	2,110,521	45	9,655
West Virginia	46	529,912	1	3,504	35	564,548	2	2,290

West:	1,253	33,631,187	735	184,275	1,017	26,617,357	1,200	158,718
Alaska	18	96,650	(D)	154	17	73,492	0	277
Arizona	17	(D)	12	2,987	15	108,302	20	556
California	446	18,659,343	515	133,648	389	17,230,476	979	117,930
Colorado	60	1,218,762	(D)	5,715	47	1,190,670	6	6,324
Hawaii	295	2,515,737	97	(D)	201	2,414,056	46	8,240
Idaho	20	232,120	(D)	1,270	11	(D)	(D)	1,648
Montana	27	141,990	(D)	936	17	95,703	(D)	416
Nevada	2	(D)	(NA)	(D)	(NA)	(NA)	(NA)	(NA)
New Mexico	24	1,147,697	(D)	(D)	24	442,871	(D)	(D)
Oregon	174	5,657,070	78	22,284	139	2,855,908	86	14,197
Utah	23	717,612	(D)	3,909	23	504,772	(D)	1,592
Washington	141	3,244,206	33	13,271	129	1,690,757	63	7,538
Wyoming	6	(D)	(NA)	101	5	10,350	(D)	(D)
United States	7,475	139,158,414	4,614	823,246	6,405	117,450,752	4,302	648,240

(D) = Data are not published to avoid disclosure, but are included in U.S. totals.

(NA) = Not available.

Source: 1992 Census of Agriculture.

Appendix table 1d--Bedding and garden plants: Farms, acreage, and sales, by region and State, 1992 and 1987

Region and State	1992				1987			
	Area under		Acreage in the open	Sales	Area under		Acreage in the open	Sales
	Farms	glass or other protection			Farms	glass or other protection		
	Number	Square feet	Acres	\$1,000	Number	Square feet	Acres	\$1,000
Northeast:	4,180	44,216,013	1,511	227,874	3,373	32,691,807	1,009	142,240
Connecticut	316	4,307,981	95	23,738	212	2,848,563	124	15,175
Maine	364	1,700,872	104	9,446	239	981,425	29	4,293
Massachusetts	519	5,028,360	265	26,127	445	4,015,097	207	19,451
New Hampshire	197	1,279,918	55	8,689	136	834,904	17	4,475
New Jersey	549	7,381,873	423	32,672	387	4,899,436	223	18,132
New York	1,072	12,062,962	214	57,958	942	9,203,151	208	36,383
Pennsylvania	934	11,105,235	279	63,043	839	9,005,563	148	40,342
Rhode Island	64	527,834	24	2,022	47	343,967	8	1,397
Vermont	165	820,978	52	4,179	126	559,701	45	2,592
Northcentral:	4,158	75,366,679	1,873	374,296	3,261	51,959,012	2,148	225,325
Illinois	367	4,838,499	507	26,434	338	3,964,929	543	19,205
Indiana	365	4,788,650	293	21,452	278	2,981,992	133	11,281
Iowa	274	3,564,824	35	20,134	174	2,191,065	63	10,241
Kansas	146	2,559,759	31	13,991	142	1,737,613	(D)	7,946
Michigan	798	24,518,470	519	113,112	613	16,333,656	741	65,708
Minnesota	342	5,871,044	68	27,836	285	3,964,146	80	15,950
Missouri	338	4,286,466	65	20,542	236	2,619,480	25	13,671
Nebraska	102	1,090,396	25	6,029	84	727,760	(D)	2,607
North Dakota	60	494,755	13	3,455	52	412,644	14	2,043
Ohio	883	17,426,843	221	83,568	709	12,776,327	330	55,877
South Dakota	51	931,250	(D)	5,311	46	495,528	9	3,972
Wisconsin	432	4,995,723	96	32,432	304	3,753,872	210	16,824
South:	4,640	66,805,521	4,720	406,890	3,124	39,778,294	6,297	219,762
Alabama	219	4,900,581	159	30,723	146	2,310,157	176	13,418
Arkansas	153	1,419,076	54	5,788	95	908,626	15	3,232
Delaware	33	805,968	14	3,935	33	316,360	14	1,415
Florida	387	14,278,909	699	92,136	295	8,158,128	627	54,634
Georgia	375	4,404,724	1,132	26,268	221	2,374,318	2,837	18,303
Kentucky	354	2,777,312	150	12,526	221	1,725,612	76	6,930
Louisiana	159	1,584,141	86	11,084	108	826,197	109	4,116
Maryland	326	3,564,619	359	20,652	203	2,266,163	367	14,047
Mississippi	135	1,769,924	46	7,626	86	978,570	53	4,325
North Carolina	525	7,292,094	486	37,182	417	6,030,477	377	24,160
Oklahoma	228	1,921,244	38	9,643	167	1,383,641	52	6,503
South Carolina	193	1,366,848	44	6,468	132	948,987	134	6,183
Tennessee	398	3,694,948	208	16,907	223	2,095,746	147	8,372
Texas	568	12,093,249	1,018	97,328	405	6,286,248	1,097	40,349
Virginia	428	3,851,083	208	24,236	258	2,207,648	205	10,860
West Virginia	159	1,080,801	19	4,388	114	961,416	11	2,915
West:	1,894	41,847,606	5,200	376,367	1,390	32,595,926	3,778	229,867

Alaska	51	619,699	9	5,440	48	719,805	(D)	4,314
Arizona	51	1,401,082	204	10,301	34	1,039,620	93	7,491
California	500	21,481,347	4,250	231,397	345	17,675,611	2,904	151,899
Colorado	174	3,561,883	40	30,896	143	3,010,272	61	16,762
Hawaii	73	257,210	33	(D)	38	(D)	16	(D)
Idaho	70	826,300	28	5,066	78	902,544	67	3,317
Montana	103	821,242	(D)	4,533	83	577,766	5	2,994
Nevada	12	107,398	(D)	(D)	3	(D)	(D)	(D)
New Mexico	74	676,337	41	4,668	59	515,221	4	2,502
Oregon	374	4,635,620	293	28,820	224	3,039,957	277	12,808
Utah	87	1,928,733	20	11,004	76	1,276,971	12	4,240
Washington	293	5,311,037	269	42,766	236	3,712,019	339	22,801
Wyoming	32	219,718	13	1,476	23	126,140	(D)	739
United States	14,872	228,235,819	13,816	1,391,175	11,148	157,172,776	13,315	817,960

(D) = Data are not published to avoid disclosure, but are included in U.S. totals.

Source: 1992 Census of Agriculture.

Appendix table 1e--Cut flowers and cut cultivated greens: Farms, acreage, and sales, by region and State, 1992 and 1987

Region and State	1992				1987			
	Area under		Acreage in the open	Sales	Area under		Acreage in the open	Sales
	Farms	glass or other protection			Farms	glass or other protection		
	Number	Square feet	Acres	\$1,000	Number	Square feet	Acres	\$1,000
Northeast:	1,128	6,923,063	2,029	50,252	864	8,999,426	1,778	63,115
Connecticut	67	339,016	39	1,811	56	827,270	0	6,851
Maine	92	58,128	75	682	60	45,458	45	419
Massachusetts	173	1,225,690	170	7,703	128	1,436,611	129	10,290
New Hampshire	50	661,331	18	3,702	27	0	14	0
New Jersey	217	675,386	1,065	9,527	142	650,248	1,107	7,360
New York	252	1,892,048	407	13,989	214	2,945,517	308	17,102
Pennsylvania	207	2,035,902	193	12,315	205	3,066,727	158	20,973
Rhode Island	20	15,700	10	45	7	0	2	0
Vermont	50	19,862	52	478	25	27,595	15	120
Northcentral:	1,010	7,867,031	3,659	64,862	713	9,253,811	2,156	58,145
Illinois	103	1,036,149	596	6,680	84	1,408,686	490	9,236
Indiana	93	2,469,138	106	12,543	59	2,714,099	90	13,114
Iowa	41	74,500	26	3,836	36	278,726	23	1,352
Kansas	28	14,040	35	133	16	58,919	16	190
Michigan	221	1,004,385	2,248	15,999	153	1,238,314	1,100	12,265
Minnesota	103	731,288	256	7,458	55	735,322	85	5,221
Missouri	61	367,270	7	2,724	32	303,080	26	1,231
Nebraska	22	28,742	18	175	14	36,950	12	155
North Dakota	19	(D)	24	312	4	0	0	7
Ohio	189	1,836,094	171	12,688	174	1,999,873	223	13,183
South Dakota	7	(D)	1	(D)	6	21,550	(D)	69
Wisconsin	123	305,425	171	2,314	80	458,292	91	2,122
South:	1,198	28,075,932	12,308	122,597	885	11,710,945	10,724	97,489
Alabama	32	193,750	35	862	26	108,750	74	596
Arkansas	21	49,836	100	520	11	59,950	(D)	257
Delaware	6	3,500	5	34	12	(D)	14	92
Florida	548	23,539,562	11,126	102,634	449	8,952,104	9,491	81,480
Georgia	36	115,440	51	697	20	(D)	38	659
Kentucky	42	557,790	46	3,015	22	526,505	5	2,316
Louisiana	35	142,084	50	357	15	111,252	54	225
Maryland	88	174,520	(D)	1,768	60	148,164	250	941
Mississippi	13	237,400	62	370	9	263,684	11	335
North Carolina	112	554,846	222	3,654	69	671,965	133	3,702
Oklahoma	15	40,720	9	120	15	82,834	8	207
South Carolina	33	48,412	139	1,235	17	35,881	61	430
Tennessee	48	269,762	90	1,025	30	276,802	139	1,544
Texas	53	1,648,786	97	1,790	50	(D)	249	1,533
Virginia	98	389,290	269	4,125	65	307,554	197	2,523
West Virginia	18	110,234	7	391	15	165,500	(D)	649

West:	2,743	92,767,676	14,108	404,881	2,098	98,478,845	12,195	365,463
Alaska	4	(D)	(D)	7	5	(D)	1	(D)
Arizona	11	(D)	277	1,186	5	(D)	11	77
California	1,112	68,524,729	9,536	313,240	977	74,006,458	8,336	291,576
Colorado	104	5,258,236	74	24,365	78	5,396,985	39	23,337
Hawaii	958	16,499,708	1,690	36,371	700	16,002,986	1,299	26,447
Idaho	30	90,220	33	931	15	81,688	13	537
Montana	20	69,421	28	490	20	92,500	31	457
Nevada	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
New Mexico	26	(D)	18	(D)	10	(D)	7	(D)
Oregon	282	1,484,261	861	11,362	145	1,859,517	847	11,767
Utah	17	(D)	9	(D)	14	477,571	5	(D)
Washington	179	841,101	1,582	16,929	129	561,140	1,606	11,265
Wyoming	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
United States	6,065	137,462,732	32,258	645,104	4,561	131,259,189	26,955	594,478

(D) = Data are

not published to avoid disclosure, but are included in U.S. totals.

(NA) = Not available.

Source: 1992 Census of Agriculture.

Appendix table 2--Professional Plant Growers Association List of
Bedding Plants Marketed in 1994

<u>Annual Crop</u>	<u>Perennial Crop</u>
Ageratum	Achillea
Alyssum	Aquilegia
Asters	Chrysanthemum
Begonias	Dianthus
Browallia	Hemerocallis
Celosia	Hosta
Dahlias	Ornamental Grasses
Dianthus	Phlox
Dusty Miller	Primula
Geranium (s)	Salvia
Geranium (c)	
New Guinea Impatiens	
Impatiens	
Lobelia	
Marigolds	
Pansies	
Petunias	
Phlox	
Portulaca	
Salvia	
Snapdragon	
Verbena	
Vinca	
Zinnias	
Cabbage	
Peppers	
Tomatoes	

Source: Greenhouse Manager Magazine, Professional
Plant Growers Association.

Appendix table 2, continued

Horticultural Cross References

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Scientific Name Index of Cut Flowers and Cut Greens

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Appendix table 3a--Sales of farms growing foliage plants, selected states, 1987

State	Gross cash farm income	Livestock sales	Crop sales	Foliage plant sales	Government payments	Other farm-related income	Foliage plant
							sales as share of gross income
-----1,000 Dollars-----							Percent
Northeast							
Connecticut	NA	NA	NA	2,030	NA	NA	NA
Massachusetts	23,593	140	23,453	3,727	0	0	15.8
New Jersey	31,867	9	31,772	10,940	0	86	34.3
New York	28,297	142	28,041	6,489	5	109	22.9
Pennsylvania	33,086	155	32,778	9,932	42	111	30.0
North Central							
Illinois	21,718	15	21,608	5,912	95	0	27.2
Indiana	11,458	169	11,163	3,372	65	61	29.4
Iowa	8,446	8	8,430	0	0	8	0.0
Kansas	NA	NA	NA	NA	NA	NA	---
Michigan	20,829	29	20,757	5,569	0	43	27.4
Minnesota	NA	NA	NA	NA	NA	NA	---
Missouri	17,439	5,713	11,653	0	23	50	0.0
Ohio	42,918	49	42,841	16,140	0	28	37.6
Wisconsin	15,651	106	15,478	4,647	0	67	29.7
South							
Alabama	11,008	81	10,927	4,391	0	0	39.9
Arkansas	2,986	NA	2,986	1,214	0	0	40.6
Delaware	NA	NA	NA	537	NA	NA	---
Florida	386,998	5,436	381,137	280,283	0	425	72.4
Georgia	10,014	124	9,791	4,861	23	76	48.5
Kentucky	5,631	22	5,603	952	0	6	16.9
Louisiana	10,761	376	10,257	3,980	0	128	37.0
Maryland	15,666	375	15,282	4,736	0	9	30.2
Mississippi	4,188	234	3,804	1,826	6	144	43.6
North Carolina	36,454	96	36,239	6,626	73	46	18.2
Oklahoma	9,411	459	8,952	3,268	0	0	34.7
South Carolina	6,718	42	6,645	1,670	0	31	24.9
Tennessee	10,550	64	10,467	3,843	19	0	36.4
Texas	72,110	249	71,711	29,454	79	71	40.8
Virginia	12,136	156	11,980	2,946	0	0	24.3
West							
Arizona	14,445	128	14,317	7,468	0	0	51.7
California	221,216	2,775	217,689	128,594	226	526	58.1
Colorado	15,847	NA	15,847	4,671	0	0	29.5
Hawaii	17,281	19	17,118	12,621	0	144	73.0
New Mexico	NA	NA	NA	NA	NA	NA	---
Oregon	10,494	246	10,244	2,390	4	0	22.8
Utah	5	NA	NA	NA	NA	5	---
Washington	15,609	4	15,596	6,354	0	9	40.7

United States	1,208,363	18,156	1,186,759	603,174	788	2,660	49.9
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Source: 1987 Census of Agriculture.

Appendix table 3b--Sales of farms growing flowering plants, selected states, 1987

State	Gross		Flowering		Government	Other	Flowering plant
	cash farm	Livestock	Crop	plant			sales as
	income	sales	sales	sales	payments	farm-related	share of
						income	gross income
-----1,000 Dollars-----							Percent
Northeast							
Connecticut	31,095	248	30,838	11,394	1	8	36.6
Maine	5,708	7	5,701	2,441	0	0	42.8
Massachusetts	39,995	217	39,558	21,059	1	219	52.7
New Hampshire	6,797	266	6,505	NA	12	14	---
New Jersey	59,236	96	58,640	32,563	43	457	55.0
New York	72,699	305	71,996	37,420	118	280	51.5
Pennsylvania	69,464	2,695	66,540	29,078	34	195	41.9
North Central							
Illinois	38,425	103	38,089	17,464	204	29	45.4
Indiana	19,195	210	18,859	6,872	29	97	35.8
Iowa	17,160	86	16,923	NA	129	22	---
Kansas	12,572	1,170	11,402	NA	0	0	---
Michigan	64,429	296	63,905	28,302	82	146	43.9
Minnesota	20,531	86	20,419	NA	0	26	---
Missouri	30,381	5,889	24,422	NA	52	18	---
Ohio	61,906	127	61,277	30,476	36	466	49.2
Wisconsin	19,379	192	19,098	10,635	33	56	54.9
South							
Alabama	20,130	494	19,636	14,879	0	0	73.9
Arkansas	3,737	271	3,466	1,517	0	0	40.6
Delaware	5,880	840	4,920	NA	0	120	---
Florida	100,006	156	99,578	57,782	0	272	57.8
Georgia	18,295	160	17,965	11,541	40	130	63.1
Kentucky	9,604	180	9,333	3,450	85	6	35.9
Louisiana	9,663	20	9,608	3,734	0	35	38.6
Maryland	27,030	1,025	25,985	8,943	1	19	33.1
Mississippi	6,176	33	6,140	3,745	0	3	60.6
North Carolina	51,841	448	51,287	28,842	32	74	55.6
Oklahoma	8,400	554	7,842	4,304	0	4	51.2
South Carolina	24,393	33	24,108	8,023	32	220	32.9
Tennessee	17,313	373	16,882	9,314	26	32	53.8
Texas	70,766	814	69,806	43,093	128	18	60.9
Virginia	26,167	867	25,215	9,655	34	51	36.9
West Virginia	5,004	121	4,834	2,290	0	49	45.8
West							
Arizona	NA	NA	NA	NA	NA	NA	---
California	209,178	2,021	206,739	117,930	0	418	56.4
Colorado	NA	NA	NA	6,324	NA	16	---
Hawaii	12,116	25	11,950	8,240	0	141	68.0
New Mexico	NA	NA	NA	NA	NA	NA	---

Oregon	24,707	77	24,503	14,197	14	113	57.5
Utah	8,368	1,536	6,827	NA	0	5	---
Washington	22,742	36	22,696	7,538	0	10	33.1
United States	1,300,284	22,572	1,271,935	648,240	1,417	4,360	49.8

Source: 1987 Census of Agriculture.

Appendix table 3c--Sales of farms growing bedding plants, selected states, 1987

State	-----1,000 Dollars-----						Bedding plant sales as share of gross income
	Gross cash farm income	Livestock sales	Crop sales	Bedding plant sales	Government payments	Other farm-related income	
Northeast							
Connecticut	27,689	244	27,379	15,175	5	61	54.8
Maine	9,992	1,102	8,611	4,293	12	267	43.0
Massachusetts	51,466	559	50,288	19,451	12	607	37.8
New Hampshire	11,421	384	10,882	4,475	18	137	39.2
New Jersey	45,408	279	44,645	18,132	74	410	39.9
New York	88,693	944	86,891	36,383	388	470	41.0
Pennsylvania	82,350	4,716	76,451	40,342	231	952	49.0
Vermont	6,311	876	5,315	2,592	0	120	41.1
North Central							
Illinois	42,738	133	41,883	19,205	572	150	44.9
Indiana	25,653	771	24,185	11,281	412	285	44.0
Iowa	19,018	613	17,894	10,241	308	203	53.8
Kansas	18,346	2,193	16,025	10,787	127	1	58.8
Michigan	104,660	1,471	102,156	65,708	576	457	62.8
Minnesota	29,085	820	27,939	15,950	106	220	54.8
Missouri	34,628	802	33,490	13,671	208	128	39.5
Nebraska	6,476	359	5,848	2,607	266	3	40.2
Ohio	107,407	670	105,766	55,877	219	752	52.0
Wisconsin	29,850	735	28,723	16,824	128	264	56.4
South							
Alabama	18,561	309	18,191	13,418	36	25	72.2
Arkansas	6,623	419	6,149	3,232	0	55	48.8
Delaware	5,911	1,046	4,794	1,415	0	71	23.9
Florida	89,641	313	89,127	54,634	8	193	60.9
Georgia	32,021	1,170	30,609	18,303	151	91	57.2
Kentucky	15,488	1,497	13,741	6,930	107	143	44.7
Louisiana	8,349	272	8,063	4,116	0	14	49.3
Maryland	28,981	1,574	26,953	14,047	60	394	48.5
North Carolina	53,670	2,104	51,149	24,160	158	259	45.0
Oklahoma	13,606	622	12,853	6,503	52	79	47.8
South Carolina	19,280	1,426	17,530	6,183	80	244	32.1
Tennessee	18,086	825	17,050	8,372	158	53	46.3
Texas	79,161	1,530	77,247	40,349	177	207	51.0
Virginia	26,889	1,623	24,853	10,860	47	366	40.4
West Virginia	6,801	215	6,406	2,915	4	176	42.9
West							
Arizona	10,149	4	10,145	7,491	0	0	73.8
California	205,640	157	204,922	151,899	159	402	73.9
Colorado	34,390	26	34,282	16,762	0	82	48.7

Hawaii	3,036	17	3,018	NA	0	1	---
Idaho	4,624	186	4,382	3,317	24	32	71.7
Montana	5,033	347	4,660	2,994	26	0	59.5
New Mexico	4,577	157	4,420	2,502	0	0	54.7
Oregon	21,369	150	21,158	12,808	32	29	59.9
Utah	10,680	1,690	8,938	4,240	0	52	39.7
Washington	36,075	443	35,355	22,801	176	101	63.2
United States	1,528,276	37,119	1,476,253	817,960	5,286	9,618	53.5

Source: 1987 Census of Agriculture.

Appendix table 3d--Sales of farms growing cut flowers and cut greens, selected states, 1987

State	Gross cash farm income	Livestock sales	Cut flowers and crop		Government payments	Other farm- related income	Cut flowers and cut greens sales as share of gross income
			sales	sales			
-----1,000 Dollars-----							
Percent							
Northeast							
Connecticut	11,098	3,260	10,729	NA	0	9	---
Massachusetts	14,993	30	14,750	10,290	3	210	68.6
New Jersey	10,971	86	10,867	7,360	3	15	67.1
New York	25,777	393	25,237	17,102	11	136	66.3
Pennsylvania	41,271	668	40,559	20,973	0	44	50.8
North Central							
Illinois	15,283	155	14,832	9,236	296	0	60.4
Indiana	14,421	12	14,409	13,114	0	0	90.9
Iowa	4,831	468	4,241	1,352	91	31	28.0
Michigan	18,801	44	18,571	12,265	109	77	65.2
Minnesota	11,297	122	11,154	5,221	0	21	46.2
Missouri	2,902	13	2,884	1,231	0	5	42.4
Ohio	20,481	43	20,284	13,183	124	30	64.4
Wisconsin	5,743	583	5,023	2,122	93	44	36.9
South							
Alabama	717	24	693	596	0	0	83.1
Florida	93,037	1,059	91,928	81,480	4	46	87.6
Georgia	NA	NA	NA	NA	NA	NA	---
Kentucky	NA	NA	NA	2,316	NA	NA	---
Maryland	3,399	281	3,019	941	57	42	27.7
North Carolina	6,480	778	5,654	3,702	46	2	57.1
Tennessee	2,162	194	1,963	1,544	5	0	71.4
Texas	2,372	214	2,154	NA	0	4	---
Virginia	5,351	210	5,074	2,523	3	64	47.2
West							
California	324,627	340	323,808	291,576	26	453	89.8
Colorado	34,246	27	34,202	23,337	0	17	68.1
Hawaii	31,352	1,378	29,604	26,447	13	357	84.4
Oregon	16,155	253	15,545	11,767	38	319	72.8
Utah	4,166	7	4,159	3,766	0	0	90.4
Washington	21,491	328	20,910	11,265	132	121	52.4
United States	770,309	10,247	756,223	594,478	1,330	2,509	77.2

Source: 1987 Census of Agriculture.

Appendix table 4a--Optimum conditions for germination of bedding plants in Alabama

Plant Name	Seeds Per Ounce ¹	Temperature ²	Light ³	Days To Germination ⁴
Abelmoschus	3,000	75	L	14
Ageratum	210,000	70	L	5
Alyssum	90,000	70	N	5
Balsam	3,000	70	N	8
Begonia, fibrous	2,000,000	70	L	15
Broccoli	9,000	80	L	5
Brussel sprouts	8,000	80	L	5
Cabbage	7,000	85	L	5
Calendula	3,000	70	D	10
Cauliflower	7,000	80	L	5
Candytuft	9,000	70	N	8
Celosia	28,000	70	N	10
Coleus	100,000	65	L	10
Cosmos	4,000	70	N	6
Dahlia	2,800	70	N	5
Dianthus	14,000	70	N	20
Dusty Miller	7,000	65	D	10
Eggplant	6,000	85	L	7
Gazania	12,000	60	D	10
Geranium	6,000	72	D	10
Gomphrena	5,000	72	N	12
Hollyhock	2,000	60	N	10
Hypoestes	18,000	72	D	10
Impatiens	44,000	70	L	15
Lettuce	25,000	75	L	5
Lobelia	700,000	70	N	20
Marigold	10,000	70	N	5
Melampodium	5,500	65	D	10
Nasturtium	175	65	D	8
Pansy	20,000	65	D	10
Peppers	4,500	85	L	7
Petunia	200,000	70	L	10
Phlox	14,000	65	D	10
Poppy	95,000	70	N	12
Portulaca	280,000	70	D	10
Salvia	7,500	70	L	15
Snapdragon	180,000	65	L	10
Tomatoes	10,000	85	L	7
Verbena	10,000	65	D	20
Vinca	21,000	70	D	15
Zinnia	2,500	70	N	5

¹ Number of conventional seeds per ounce, amount will vary by company.

² Temperature in °F for optimum germination.

³ Required light (L) or darkness (D) or no light or dark requirement (N).

⁴ Average number of days from sowing to germination.

Source: Behe, B.K.

Appendix table 4b

Selected Cut Flower Species That May Be Grown From Seed

pages 81-84

Appendix table 5a--Expenses of U.S. foliage plant farms, by economic classes, 1987¹

Item	All farms	\$500,000- or more	\$100,000- \$499,999	\$50,000- \$99,000	\$25,000- \$49,999	\$10,000- \$24,999	Less than \$10,000
----- 1,000 Dollars -----							
Total cash farm expenses	867,540	640,426	160,386	26,194	22,012	11,198	7,325
Variable expenses	803,251	601,293	145,274	23,126	19,209	9,177	5,170
Seeds, bulbs, and other	83,409	64,177	15,171	2,210	955	592	305
Commercial fertilizer	17,846	13,040	2,940	619	541	394	312
Agricultural chemicals	23,276	18,293	3,066	595	499	475	348
Petroleum products	47,423	29,371	12,736	2,028	1,570	993	725
Electricity	20,018	12,411	4,896	943	810	561	398
Hired farm labor	336,481	263,523	57,875	7,963	4,776	1,596	749
Contract labor	31,049	22,584	6,500	660	718	347	240
Repair and maintenance	40,875	26,932	8,884	1,840	1,517	987	716
Custom work	8,002	6,436	1,104	95	134	115	118
Other expenses	194,872	144,526	32,102	6,173	7,689	3,117	1,259
Fixed expenses	64,289	39,133	15,112	3,068	2,803	2,021	2,155
Interest expense	41,394	25,393	10,545	1,692	1,755	1,010	1,000
Cash rent	9,716	6,912	1,606	638	197	222	142
Property taxes	13,179	6,828	2,961	738	851	789	1,013

¹ Values include expenses for livestock sales and other crop sales.

Sources: 1987 Census of Agriculture; Johnson and Johnson.

Appendix table 5b--Expenses of U.S. potted flowering plant farms, by economic classes, 1987¹

Item	All farms	\$500,000- or more	\$100,000- \$499,999	\$50,000- \$99,000	\$25,000- \$49,999	\$10,000- \$24,999	Less than \$10,000
----- 1,000 Dollars -----							
Total cash farm expenses	888,084	602,283	197,198	39,172	25,313	14,317	9,801
Variable expenses	822,803	565,845	180,819	34,422	22,255	11,989	7,472
Seeds, bulbs, and other	92,516	65,248	20,203	3,707	1,653	1,323	382
Commercial fertilizer	13,707	8,309	3,006	849	618	500	425
Agricultural chemicals	15,413	10,868	2,460	687	489	503	405
Petroleum products	60,550	34,118	17,957	3,900	2,000	1,450	1,125
Electricity	23,409	13,609	6,006	1,560	1,011	692	531
Hired farm labor	347,407	254,095	75,175	10,732	5,109	1,737	558
Contract labor	23,843	17,148	5,013	780	420	329	153
Repair and maintenance	42,388	23,799	11,254	2,801	1,840	1,529	1,165
Custom work	3,846	2,231	958	175	181	187	115
Other expenses	199,724	136,420	38,787	9,231	8,934	3,739	2,613
Fixed expenses	65,281	36,438	16,379	4,750	3,058	2,328	2,329
Interest expense	40,130	23,301	10,229	2,782	1,755	1,030	1,033
Cash rent	10,047	7,118	1,924	503	192	225	86
Property taxes	15,104	6,019	4,226	1,465	1,111	1,073	1,210

¹ Values include expenses for livestock sales and other crop sales.

Sources: 1987 Census of Agriculture; Johnson and Johnson.

Appendix table 5c--Expenses of U.S. bedding and garden plant farms, by economic classes, 1987¹

Item	All farms	\$500,000- or more	\$100,000- \$499,999	\$50,000- \$99,000	\$25,000- \$49,999	\$10,000- \$24,999	Less than \$10,000
----- 1,000 Dollars -----							
Total cash farm expenses	1,032,389	592,147	278,631	68,871	40,301	30,999	21,440
Variable expenses	943,870	553,930	254,024	59,918	33,860	25,502	16,638
Seeds, bulbs, and other	91,896	52,397	26,513	6,389	3,153	2,577	866
Commercial fertilizer	23,520	10,809	7,555	1,954	1,324	1,120	759
Agricultural chemicals	23,972	13,274	6,227	1,745	1,141	1,026	559
Petroleum products	74,340	33,168	25,087	7,223	3,944	2,814	2,104
Electricity	27,616	12,900	8,361	2,599	1,500	1,327	928
Hired farm labor	377,945	244,038	101,574	18,505	8,747	3,796	1,285
Contract labor	31,365	20,896	6,884	1,854	841	621	270
Repair and maintenance	55,309	24,870	17,025	4,879	3,472	2,835	2,228
Custom work	7,929	4,506	2,026	515	360	317	204
Other expenses	229,978	137,072	52,772	14,255	9,378	9,069	7,435
Fixed expenses	88,519	38,217	24,607	8,953	6,441	5,497	4,802
Interest expense	51,717	23,274	15,243	4,863	3,344	2,724	2,268
Cash rent	14,830	8,896	3,292	1,321	633	406	281
Property taxes	21,972	6,047	6,072	2,769	2,464	2,367	2,253

¹ Values include expenses for livestock sales and other crop sales.

Sources: 1987 Census of Agriculture; Johnson and Johnson.

Appendix table 5d--Expenses of U.S. cut flower and cut cultivated green farms, by economic classes, 1987¹

Item	All farms	\$500,000- or more	\$100,000- \$499,999	\$50,000- \$99,000	\$25,000- \$49,999	\$10,000- \$24,999	Less than \$10,000
----- 1,000 Dollars -----							
Total cash farm expenses	541,278	357,335	125,418	25,646	13,872	9,437	9,570
Variable expenses	494,972	333,078	112,973	22,509	11,471	7,491	7,451
Seeds, bulbs, and other	33,796	22,135	8,169	1,876	683	614	318
Commercial fertilizer	13,124	7,203	3,349	1,032	632	431	477
Agricultural chemicals	14,520	9,095	3,179	916	466	458	407
Petroleum products	35,677	21,694	9,246	1,992	1,181	813	751
Electricity	16,757	9,844	4,782	944	461	387	340
Hired farm labor	219,980	156,913	49,211	8,099	3,632	1,375	750
Contract labor	18,363	12,503	3,722	1,166	475	263	235
Repair and maintenance	26,880	15,627	6,630	1,675	1,130	883	935
Custom work	4,674	3,010	1,147	166	157	82	112
Other expenses	111,201	75,054	23,538	4,643	2,654	2,185	3,126
Fixed expenses	46,306	24,257	12,445	3,137	2,401	1,946	2,119
Interest expense	24,936	12,976	7,386	1,695	1,173	951	755
Cash rent	9,674	6,264	2,205	436	354	207	207
Property taxes	11,696	5,017	2,854	1,006	874	788	1,157

¹ Values include expenses for livestock sales and other crop sales.

Sources: 1987 Census of Agriculture; Johnson and Johnson.

Appendix table 6a--Cost Of Production For Bedding Plants By Conventional (Transplant) and Plug Production Methods

1. Materials (Direct Cost)	Conventional Production	Plug Production
Seedling	\$0.35 to 0.40	\$0.60 to 0.80
Flat	\$0.24 to 0.35	\$0.24 to 0.35
Insert	\$0.22 to 0.25	\$0.22 to 0.25
Medium	\$0.30 to 0.38	\$0.30 to 0.38
Label	\$0.10 to 0.20	\$0.10 to 0.20
Fertilizer	\$0.03 to 0.05	\$0.03 to 0.05
Insecticide	\$0.01 to 0.05	\$0.01 to 0.05
Fungicide	\$0.03 to 0.05	\$0.02 to 0.05
Subtotal	\$1.28 to 1.73	\$1.52 to 2.13
2. Labor (Direct Cost)		
Fill flat	\$0.05 to 0.08	\$0.05 to 0.08
Transplant, and move	\$0.20 to 0.40	\$0.20 to 0.40
Water	\$0.05 to 0.08	\$0.05 to 0.08
Spray pesticide	\$0.02 to 0.05	\$0.02 to 0.05
Harvest	\$0.05 to 0.07	\$0.05 to 0.07
Subtotal	\$0.37 to 0.68	\$0.37 to 0.68
3. Overhead (Indirect Cost)		
Salaries	\$0.30 to 0.50	\$0.30 to 0.50
Depreciation	\$0.15 to 0.20	\$0.20 to 0.35
Interest on fixed assets	\$0.15 to 0.20	\$0.15 to 0.25
Fuel	\$0.15 to 0.20	\$0.05 to 0.10
Other	\$0.20 to 0.75	\$0.20 to 0.75
Subtotal	\$0.95 to 1.85	\$0.90 to 1.95
Loss	\$0.10 to 0.20	\$0.05 to 0.10
4. Total Costs of Production	\$2.70 to 4.46	\$2.84 to 4.83

Source: Behe, B.K.

Appendix table 6b

Cost of Production Budgets for Selected States

Texas
South Florida
Central Florida

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Appendix table 7a--Disaster assistance payments for foliage plants, 1988-93

Region and State	Average foliage plant acreage in the open 1987-92	Share of U.S. acreage	Total disaster payments for foliage plants 1988-93	Share of U.S. foliage plant disaster payments
	Acres	Percent	Thousand Dollars	Percent
Northeast:				
Pennsylvania	174	1.57	36.4	0.62
North Central:				
Iowa	(D)	--	1.0	0.02
Kansas	27	0.24	0.5	0.01
South:				
Florida	5,264	47.67	5,810.7	99.19
Mississippi	35	0.31	1.2	0.02
North Carolina	98	0.89	0.1	0.00
Texas	1,223	11.08	2.4	0.04
West:				
Hawaii	674	6.10	5.8	0.10
Eight States	7,495	67.86	5,858.1	100.00
United States	11,041	100.00	5,858.1	100.00

(D) = Data are not published to avoid disclosure, but are included in U.S.

Note: A linear trend was used to estimate acreage data for 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on potted foliage plants acreage in the open.

Source: 1987 and 1992 Census of Agriculture. Data on disaster payments are from ASCS data files compiled by the General Accounting Office.

Appendix table 7b--Disaster assistance payments for flowering plants, 1988-93

Region and State	Average acreage in the open for flowering plants 1987-92	Share of U.S. acreage	Total disaster payments for flowering plants 1988-93	Share of U.S. flowering plants disaster payments
	Acres	Percent	Thousand Dollars	Percent
Northeast:				
Massachusetts	110	2.46	1.6	0.12
North Central:				
Iowa	(D)	--	2.6	0.19
Kansas	19	0.43	2.3	0.17
Minnesota	17	0.38	1.6	0.12
Ohio	92	2.05	3.4	0.26
Wisconsin	37	0.83	7.4	0.56
South:				
Florida	425	9.53	1,236.8	92.65
Georgia	115	2.57	28.3	2.12
Louisiana	37	0.82	5.1	0.38
North Carolina	252	5.65	0.1	0.00
West:				
Hawaii	72	1.60	45.7	3.42
Eleven States	1,176	26.32	1,334.9	100.00
United States	4,458	100.00	1,334.9	100.00

(D) = Data are not published to avoid disclosure, but are included in U.S.

Note: A linear trend was used to estimate acreage data for 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on potted flowering plants acreage in the open.

Source: 1987 and 1992 Census of Agriculture. Data on disaster payments are from ASCS data files compiled by the General Accounting Office.

Appendix table 7c--Disaster assistance payments for bedding plants, 1988-93

Region and State	Average acreage in the open for bedding plants 1987-92	Share of U.S. acreage	Total disaster payments for bedding plants 1988-93	Share of U.S. bedding plants disaster payments
	Acres	Percent	Thousand Dollars	Percent
Northeast:				
Massachusetts	236	1.74	1.3	0.13
New Jersey	323	2.38	18.9	1.94
New York	211	1.56	1.3	0.13
Pennsylvania	214	1.57	8.2	0.84
North Central:				
Iowa	49	0.36	0.2	0.02
Kansas	31	0.23	1.4	0.14
Michigan	630	4.64	1.7	0.17
Minnesota	74	0.55	0.3	0.03
Missouri	45	0.33	21.3	2.18
Ohio	276	2.03	2.9	0.29
South:				
Alabama	168	1.23	15.7	1.61
Arkansas	35	0.25	0.1	0.01
Florida	663	4.89	0.7	0.07
Georgia	1,985	14.63	655.2	67.09
Mississippi	50	0.36	1.8	0.18
North Carolina	432	3.18	204.7	20.97
Texas	1,058	7.80	7.4	0.76
West:				
California	3,577	26.37	33.4	3.42
Washington	304	2.24	0.2	0.02
19-States	10,361	76.37	976.5	100.00
United States	13,566	100.00	976.5	100.00

(D) = Data are not published to avoid disclosure, but are included in U.S.

Note: A linear trend was used to estimate acreage data for 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on bedding plants acreage in the open.

Source: 1987 and 1992 Census of Agriculture. Data on disaster payments are from ASCS data files compiled by the General Accounting Office.

Appendix table 7d--Disaster assistance payments for cut flowers and cut greens, 1988-93

Region and State	Average acreage in the open for cut flowers & cut greens 1987-92	Share of U.S. acreage	Total disaster payments for cut flowers & cut greens 1988-93	Share of U.S. cut flowers & cut greens disaster payments
	Acres	Percent	Thousand Dollars	Percent
Northeast:				
Connecticut	39	0.13	28.6	0.48
Maine	60	0.20	10.1	0.17
Massachusetts	150	0.50	136.3	2.29
New Hampshire	16	0.05	1.1	0.02
New Jersey	1,086	3.67	26.7	0.45
New York	358	1.21	100.3	1.68
Pennsylvania	176	0.59	1.4	0.02
Rhode Island	6	0.02	2.5	0.04
North Central:				
Illinois	543	1.83	168.9	2.83
Indiana	98	0.33	42.8	0.72
Iowa	25	0.08	30.7	0.51
Kansas	26	0.09	10.9	0.18
Michigan	1,674	5.65	138.2	2.32
Minnesota	171	0.58	432.6	7.26
Missouri	17	0.06	9.0	0.15
North Dakota	24	0.08	4.1	0.07
Ohio	197	0.67	71.9	1.21
Wisconsin	131	0.44	99.3	1.67
South:				
Alabama	55	0.18	61.4	1.03
Florida	10,309	34.82	909.9	15.27
Georgia	45	0.15	2.1	0.04
Kentucky	26	0.09	1.6	0.03
Louisiana	52	0.18	23.8	0.40
Mississippi	37	0.12	11.2	0.19
North Carolina	178	0.60	0.8	0.01
South Carolina	100	0.34	31.9	0.54
Tennessee	115	0.39	0.9	0.01
Texas	173	0.58	398.7	6.69
Virginia	233	0.79	2.9	0.05
West Virginia	7	0.02	13.3	0.22
West:				

California	8,936	30.18	1,677.7	28.15
Colorado	57	0.19	6.9	0.12
Hawaii	1,495	5.05	1,356.0	22.75
Idaho	23	0.08	5.1	0.08
Montana	30	0.10	36.9	0.62
New Mexico	13	0.04	0.1	0.00
Oregon	854	2.88	22.7	0.38
Washington	1,594	5.38	81.0	1.36
38-States	29,129	98.39	5,960.3	100.00
United States	29,607	100.00	5,960.3	100.00

(D) = Data are not published to avoid disclosure, but are included in U.S.

Note: A linear trend was used to estimate acreage data for 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on acreage for cut flowers and cut greens.

Source: 1987 and 1992 Census of Agriculture. Data on disaster payments are from ASCS data files compiled by the General Accounting Office.

Appendix table 8a--Foliage plants: Estimated crop value and disaster assistance, by States, 1988-93

Region and State	Estimated cumulative crop value 1988-92	Total disaster payments for foliage plants 1988-93	Disaster payments, percent of crop value
	-----Thousand dollars-----		Percent
Northeast:			
Pennsylvania	45,463	36	0.08
North Central:			
Iowa	10,023	1	0.01
Kansas	9,336	0.5	0.00
South:			
Florida	1,452,739	5,811	0.40
Mississippi	7,855	1	0.02
North Carolina	56,767	0.1	0.00
Texas	173,130	2	0.00
West:			
Hawaii	72,801	6	0.01
United States	3,076,116	5,858	0.19

Note: A linear trend was used to estimate crop values during 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on sales of potted foliage plants.

Source: 1987 and 1992 Census of Agriculture. Disaster payments are from ASCS data files, compiled by the General Accounting Office.

Appendix table 8b--Flowering plants: Estimated crop value and disaster assistance, by States, 1988-93

Region and State	Estimated cumulative crop value 1988-92	Total disaster payments for flowering plants 1988-93	Disaster payments, percent of crop value
	-----Thousand dollars-----		Percent
Northeast:			
Massachusetts	104,752	1.6	0.00
North Central:			
Iowa	48,351	2.6	0.01
Kansas	35,216	2.3	0.01
Minnesota	56,127	1.6	0.00
Ohio	196,762	3.4	0.00
Wisconsin	47,241	7.4	0.02
South:			
Florida	353,116	1,236.8	0.35
Georgia	71,823	28.3	0.04
Louisiana	22,681	5.1	0.02
North Carolina	188,943	0.1	0.00
West:			
Hawaii	(D)	45.7	--
United States	3,766,218	1,334.9	0.04

Note: A linear trend was used to estimate crop values during 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on sales of potted flowering plants.

Source: 1987 and 1992 Census of Agriculture. Disaster payments are from ASCS data files, compiled by the General Accounting Office.

Appendix table 8c--Bedding plants: Estimated crop value and disaster assistance, by States, 1988-93

Region and State	Estimated cumulative crop value 1988-92	Total disaster payments for bedding plants 1988-93	Disaster payments, percent of crop value
	-----Thousand dollars-----		Percent
Northeast:			
Massachusetts	117,283	1.3	0.00
New Jersey	134,280	18.9	0.01
New York	246,640	1.3	0.00
Pennsylvania	269,813	8.2	0.00
North Central:			
Iowa	80,884	0.2	0.00
Kansas	57,865	1.4	0.00
Michigan	470,752	1.7	0.00
Minnesota	115,408	0.3	0.00
Missouri	88,968	21.3	0.02
Ohio	362,458	2.9	0.00
South:			
Alabama	111,005	15.7	0.01
Arkansas	23,828	0.1	0.00
Florida	385,676	0.7	0.00
Georgia	115,410	655.2	0.57
Mississippi	31,528	1.8	0.01
North Carolina	159,866	204.7	0.13
Texas	372,682	7.4	0.00
West:			
California	997,989	33.4	0.00
Washington	173,900	0.2	0.00
United States	5,809,445	976.5	0.02

Note: A linear trend was used to estimate crop values during 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on sales of potted bedding plants.

Source: 1987 and 1992 Census of Agriculture. Disaster payments are from ASCS data files, compiled by the General Accounting Office.

Appendix table 8d--Cut flowers and cut greens: Estimated crop value and disaster assistance, by States, 1988-93

Region and State	Estimated cumulative crop value 1988-92	Total disaster payments for cut flowers & cut greens 1988-93	Disaster payments, percent of crop value
	-----Thousand dollars -----		Percent
Northeast:			
Connecticut	19,135	28.6	0.15
Maine	2,884	10.1	0.35
Massachusetts	43,689	136.3	0.31
New Hampshire	18,510	1.1	0.01
New Jersey	43,301	26.7	0.06
New York	76,171	100.3	0.13
Pennsylvania	78,891	1.4	0.00
Rhode Island	255	2.5	0.98
North Central:			
Illinois	38,512	168.9	0.44
Indiana	63,857	42.8	0.07
Iowa	14,212	30.7	0.22
Kansas	779	10.9	1.40
Michigan	72,527	138.2	0.19
Minnesota	32,816	432.6	1.32
Missouri	10,634	9.0	0.08
North Dakota	950	4.1	0.43
Ohio	64,430	71.9	0.11
Wisconsin	11,186	99.3	0.89
South:			
Alabama	3,778	61.4	1.62
Florida	470,862	909.9	0.19
Georgia	3,409	2.1	0.06
Kentucky	13,677	1.6	0.01
Louisiana	1,521	23.8	1.56
Mississippi	1,780	11.2	0.63
North Carolina	18,366	0.8	0.00
South Carolina	4,565	31.9	0.70
Tennessee	6,163	0.9	0.01
Texas	8,436	398.7	4.73
Virginia	17,421	2.9	0.02
West Virginia	2,471	13.3	0.54
West:			
California	1,522,872	1,677.7	0.11
Colorado	119,769	6.9	0.01

Hawaii	162,007	1,356.0	0.84
Idaho	3,867	5.1	0.13
Montana	2,384	36.9	1.55
New Mexico	(D)	0.1	--
Oregon	57,620	22.7	0.04
Washington	73,317	81.0	0.11
United States	3,124,268	5,960.3	0.19

Note: A linear trend was used to estimate crop values during 1988 through 1991 utilizing 1987 and 1992 Census of Agriculture data on sales of cut flowers and cut greens.

Source: 1987 and 1992 Census of Agriculture. Disaster payments are from ASCS data files, compiled by the General Accounting Office.

Appendix table 2a--Nursery crop farms: Number of farms, by size of farm and by region and State, 1987

		-----Total value of agricultural sales-----			
Region and State	All farms Less than \$25,000 - \$10,000 - \$24,999	\$500,000 or more \$10,000	\$100,000 - \$499,999	\$50,000 - \$99,999	
Northeast:	2,931	133	353	232	
321	612	1,280			
Connecticut	192	19	23	17	
22	51	60			
Maine	84	3	5	8	
8	21	39			
Massachusetts	244	12	30	19	
33	48	102			
New Hampshire	59	3	5	6	
8	12	25			
New Jersey	759	33	93	49	
78	158	348			
New York	593	28	80	57	
76	114	238			
Pennsylvania	900	28	101	68	
86	190	427			
Rhode Island	39	7	7	3	
2	5	15			
Vermont	61	2	7	5	
8	13	26			
North Central:	2,927	140	372	276	
344	623	1,172			
Illinois	363	33	61	39	
44	74	112			
Indiana	259	9	41	14	
34	58	103			
Iowa	123	4	18	12	
12	28	49			
Kansas	88	4	11	6	
8	20	39			
Michigan	662	23	85	73	
83	146	252			
Minnesota	210	10	24	12	
28	37	99			
Missouri	178	10	25	16	
20	37	70			

	Nebraska	79	2	9	6
7	8	47			
	North Dakota	27	1	4	6
4	3	9			
	Ohio	632	32	61	70
63	140	266			
	South Dakota	34	1	5	4
5	8	11			
	Wisconsin	272	11	28	18
36	64	115			
	South:	6,340	342	935	621
761	1,263	2,418			
	Alabama	222	18	41	24
18	42	79			
	Arkansas	83	2	10	10
11	12	38			
	Delaware	35	4	4	3
6	6	12			
	Florida	1,964	131	368	250
253	360	602			
	Georgia	292	10	50	35
27	63	107			
	Kentucky	159	8	24	14
19	36	58			
	Louisiana	259	7	32	24
35	47	114			
	Maryland	253	16	31	20
23	66	97			
	Mississippi	99	4	16	10
11	28	30			
	North Carolina	923	20	89	59
117	215	423			
	Oklahoma	103	8	19	6
12	24	34			
	South Carolina	211	13	36	16
23	46	77			
	Tennessee	663	38	74	57
69	118	307			
	Texas	649	39	91	65
80	131	243			
	Virginia	354	23	45	22
48	53	163			
	West Virginia	71	1	5	6
9	16	34			
	West:	3,154	295	582	290
350	538	1,099			
	Alaska	N/A	N/A	N/A	N/A
N/A	N/A	N/A			
	Arizona	115	19	33	6
12	16	29			

	California	1,137	186	273	102
124	183	269			
	Colorado	131	4	32	12
15	20	48			
	Hawaii	196	3	23	24
19	33	94			
	Idaho	97	1	11	13
7	9	56			
	Montana	44	1	3	6
7	10	17			
	Nevada	N/A	N/A	N/A	N/A
N/A	N/A	N/A			
	New Mexico	67	3	11	7
8	11	27			
	Oregon	889	54	147	81
94	166	347			
	Utah	61	4	5	7
3	13	29			
	Washington	379	20	39	26
55	71	168			
	Wyoming	N/A	N/A	N/A	N/A
N/A	N/A	N/A			
	United States	15,352	910	2,242	1,419
1,776	3,036	5,969			

Source: 1987 Census of Agriculture.

Table 2b--Size distribution of farms producing nursery crops, by region and State, 1987

		-----Total value of agricultural sales-----			
Region and State	All farms Less than \$10,000 - \$24,999	\$500,000 or more	\$100,000 - \$499,999	\$50,000 - \$99,999	
		-----Percent of farms-----			
Northeast:	2,931	4.5	12.0	7.9	
11.0	20.9	43.7			
Connecticut	192	9.9	12.0	8.9	
11.5	26.6	31.3			
Maine	84	3.6	6.0	9.5	
9.5	25.0	46.4			
Massachusetts	244	4.9	12.3	7.8	
13.5	19.7	41.8			
New Hampshire	59	5.1	8.5	10.2	
13.6	20.3	42.4			
New Jersey	759	4.3	12.3	6.5	
10.3	20.8	45.8			
New York	593	4.7	13.5	9.6	
12.8	19.2	40.1			
Pennsylvania	900	3.1	11.2	7.6	
9.6	21.1	47.4			
Rhode Island	39	17.9	17.9	7.7	
5.1	12.8	38.5			
Vermont	61	3.3	11.5	8.2	
13.1	21.3	42.6			
North Central:	2,927	4.8	12.7	9.4	
11.8	21.3	40.0			
Illinois	363	9.1	16.8	10.7	
12.1	20.4	30.9			
Indiana	259	3.5	15.8	5.4	
13.1	22.4	39.8			
Iowa	123	3.3	14.6	9.8	
9.8	22.8	39.8			
Kansas	88	4.5	12.5	6.8	
9.1	22.7	44.3			
Michigan	662	3.5	12.8	11.0	
12.5	22.1	38.1			
Minnesota	210	4.8	11.4	5.7	
13.3	17.6	47.1			
Missouri	178	5.6	14.0	9.0	
11.2	20.8	39.3			

	Nebraska	79	2.5	11.4	7.6
8.9	10.1	59.5			
	North Dakota	27	3.7	14.8	22.2
14.8	11.1	33.3			
	Ohio	632	5.1	9.7	11.1
10.0	22.2	42.1			
	South Dakota	34	2.9	14.7	11.8
14.7	23.5	32.4			
	Wisconsin	272	4.0	10.3	6.6
13.2	23.5	42.3			
	South:	6,340	5.4	14.7	9.8
12.0	19.9	38.1			
	Alabama	222	8.1	18.5	10.8
8.1	18.9	35.6			
	Arkansas	83	2.4	12.0	12.0
13.3	14.5	45.8			
	Delaware	35	11.4	11.4	8.6
17.1	17.1	34.3			
	Florida	1,964	6.7	18.7	12.7
12.9	18.3	30.7			
	Georgia	292	3.4	17.1	12.0
9.2	21.6	36.6			
	Kentucky	159	5.0	15.1	8.8
11.9	22.6	36.5			
	Louisiana	259	2.7	12.4	9.3
13.5	18.1	44.0			
	Maryland	253	6.3	12.3	7.9
9.1	26.1	38.3			
	Mississippi	99	4.0	16.2	10.1
11.1	28.3	30.3			
	North Carolina	923	2.2	9.6	6.4
12.7	23.3	45.8			
	Oklahoma	103	7.8	18.4	5.8
11.7	23.3	33.0			
	South Carolina	211	6.2	17.1	7.6
10.9	21.8	36.5			
	Tennessee	663	5.7	11.2	8.6
10.4	17.8	46.3			
	Texas	649	6.0	14.0	10.0
12.3	20.2	37.4			
	Virginia	354	6.5	12.7	6.2
13.6	15.0	46.0			
	West Virginia	71	1.4	7.0	8.5
12.7	22.5	47.9			
	West:	3,154	9.4	18.5	9.2
11.1	17.1	34.8			
	Alaska	N/A	N/A	N/A	N/A
N/A	N/A	N/A			
	Arizona	115	16.5	28.7	5.2
10.4	13.9	25.2			

	California	1,137	16.4	24.0	9.0
10.9	16.1	23.7			
	Colorado	131	3.1	24.4	9.2
11.5	15.3	36.6			
	Hawaii	196	1.5	11.7	12.2
9.7	16.8	48.0			
	Idaho	97	1.0	11.3	13.4
7.2	9.3	57.7			
	Montana	44	2.3	6.8	13.6
15.9	22.7	38.6			
	Nevada	N/A	N/A	N/A	N/A
N/A	N/A	N/A			
	New Mexico	67	4.5	16.4	10.4
11.9	16.4	40.3			
	Oregon	889	6.1	16.5	9.1
10.6	18.7	39.0			
	Utah	61	6.6	8.2	11.5
4.9	21.3	47.5			
	Washington	379	5.3	10.3	6.9
14.5	18.7	44.3			
	Wyoming	N/A	N/A	N/A	N/A
N/A	N/A	N/A			
	United States	15,352	5.9	14.6	9.2
11.6	19.8	38.9			

Source: 1987 Census of Agriculture.

Appendix table 3--Organizational type of farms growing nursery crops,
by sales class and region, 1987

Organizational type and region	-----Total value of agricultural sales-----					
	All farms	\$500,000 or more	\$100,000 to \$499,999	\$50,000 to \$99,999	\$25,000 to \$49,999	Less than \$25,000
	-----Number of farms-----					
Individual or family						
Northeast	2,102	22	167	136	221	1,556
North Central	2,065	18	164	175	240	1,468
South	4,237	57	396	358	481	2,945
West	2,142	44	276	187	266	1,369
U.S.	10,546	141	1,003	856	1,208	7,338
Partnership						
Northeast	260	13	44	27	33	143
North Central	239	6	41	31	25	136
South	690	29	124	82	115	340
West	375	38	81	46	38	172
U.S.	1,564	86	290	186	211	791
Corporation						
Family-held						
Northeast	493	85	122	60	58	168
North Central	533	102	145	62	67	157
South	1,159	209	348	153	139	310
West	500	164	184	48	37	67
U.S.	2,685	560	799	323	301	702
Other than family-held						
Northeast	56	12	15	6	6	17
North Central	68	13	16	5	10	24
South	191	45	64	24	22	36
West	111	48	37	5	6	15
U.S.	426	118	132	40	44	92
Other						
Northeast	20	1	5	3	3	8
North Central	22	1	6	3	2	10
South	63	2	3	4	4	50
West	26	1	4	4	3	14
U.S.	131	5	18	14	12	82

Source: 1987 U.S. Census of Agriculture.

Appendix table 4a--Sales of farms growing nursery crops, by sales classes and regions, 1987

Item and region \$10,000- Less than		All farms	-----Total value of agricultural sales-----			
			\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999

----- \$1,000 -----

Gross cash farm income: 1/

Northeast		350,132	226,142	76,532	16,809	11,995
11,070	7,584					
North Central		362,966	230,505	81,179	21,158	12,927
10,814	6,383					
South		910,701	593,001	199,711	47,117	30,097
24,337	16,438					
West		918,754	735,168	133,006	21,895	12,603
9,987	6,095					
U. S.		2,542,553	1,784,816	490,428	106,979	67,622
56,208	36,500					

Livestock sales: 2/

Northeast		3,134	356	299	282	634
443	1,120					
North Central		4,090	96	1,433	844	754
359	604					
South		24,539	9,711	1,569	3,415	2,794
2,756	4,294					
West		7,135	137	2,984	1,471	230
1,399	914					
U. S.		38,898	10,300	6,285	6,012	4,412
4,957	6,932					

Crop sales:

Northeast		341,851	224,908	75,326	15,664	10,963
9,606	5,384					
North Central		353,600	229,779	78,252	19,064	11,858
9,823	4,824					
South		876,826	581,348	196,150	42,836	26,292
19,989	10,211					
West		907,350	732,859	129,168	20,290	12,135
8,481	4,417					
U. S.		2,479,627	1,768,894	478,896	97,854	61,248
47,899	24,836					

Nursery crop sales: 3/

Northeast		279,987	187,852	58,458	12,334	8,504
8,106	4,733					

North Central	296,789	200,954	59,317	14,305	9,657
8,360 4,196					
South	674,680	422,962	167,417	36,180	22,121
17,227 8,773					
West	739,553	598,835	103,857	15,648	10,103
7,335 3,775					
U. S.	1,991,009	1,410,603	389,049	78,467	50,385
41,028 21,477					

Government payments: 4/

Northeast	394	87	193	41	29
23 21					
North Central	1,277	48	642	305	69
95 118					
South	1,664	591	625	165	58
163 62					
West	1,122	648	363	21	29
4 57					
U. S.	4,457	1,374	1,823	532	185
285 258					

Other farm-related payments: 5/

Northeast	4,753	791	714	822	369
998 1,059					
North Central	3,999	582	852	945	246
537 837					
South	7,672	1,351	1,367	701	953
1,429 1,871					
West	3,147	1,524	491	113	209
103 707					
U. S.	19,571	4,248	3,424	2,581	1,777
<u>3,067</u> <u>4,474</u>					

See footnotes at end of table 3b.

Appendix table 4b--Sales of farms growing nursery crops, by sales classes and regions, 1987

Item and region \$10,000- Less than		-----Total value of agricultural sales-----				
		All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
<u>\$24,999</u> <u>\$10,000</u>						
		-----Percent of region income-----				
Gross cash farm income:						
Northeast		100.0	64.6	21.9	4.8	3.4
3.2	2.2					
North Central		100.0	63.5	22.4	5.8	3.6
3.0	1.8					
South		100.0	65.1	21.9	5.2	3.3
2.7	1.8					
West		100.0	80.0	14.5	2.4	1.4
1.1	0.7					
U. S.		100.0	70.2	19.3	4.2	2.7
2.2	1.4					
		-----Percent of gross income-----				
Livestock sales:						
Northeast		0.9	0.2	0.4	1.7	5.3
4.0	14.8					
North Central		1.1	0.0	1.8	4.0	5.8
3.3	9.5					
South		2.7	1.6	0.8	7.2	9.3
11.3	26.1					
West		0.8	0.0	2.2	6.7	1.8
14.0	15.0					
U. S.		1.5	0.6	1.3	5.6	6.5
8.8	19.0					
		-----Percent of gross income-----				
Crop sales:						
Northeast		97.6	99.5	98.4	93.2	91.4
86.8	71.0					
North Central		97.4	99.7	96.4	90.1	91.7
90.8	75.6					
South		96.3	98.0	98.2	90.9	87.4
82.1	62.1					
West		98.8	99.7	97.1	92.7	96.3
84.9	72.5					
U. S.		97.5	99.1	97.6	91.5	90.6
85.2	68.0					

		-----Percent of crop sales-----				

Nursery crop sales:						
Northeast		81.9	83.5	77.6	78.7	77.6
84.4	87.9					
North Central		83.9	87.5	75.8	75.0	81.4
85.1	87.0					
South		76.9	72.8	85.4	84.5	84.1
86.2	85.9					
West		81.5	81.7	80.4	77.1	83.3
86.5	85.5					
U. S.		80.3	79.7	81.2	80.2	82.3
85.7	86.5					

		-----Percent of gross income-----				

Nursery crop sales:						
Northeast		80.0	83.1	76.4	73.4	70.9
73.2	62.4					
North Central		81.8	87.2	73.1	67.6	74.7
77.3	65.7					
South		74.1	71.3	83.8	76.8	73.5
70.8	53.4					
West		80.5	81.5	78.1	71.5	80.2
73.4	61.9					
U. S.		78.3	79.0	79.3	73.3	74.5
73.0	58.8					

		-----Percent of gross income-----				

Other farm-related payments:						
Northeast		1.4	0.3	0.9	4.9	3.1
9.0	14.0					
North Central		1.1	0.3	1.0	4.5	1.9
5.0	13.1					
South		0.8	0.2	0.7	1.5	3.2
5.9	11.4					
West		0.3	0.2	0.4	0.5	1.7
1.0	11.6					
U. S.		0.8	0.2	0.7	2.4	2.6
5.5	12.3					

1/ Includes livestock and crop sales, government payments, and other farm-related income.

2/ Includes livestock, dairy, and poultry sales.

3/ Includes only "nursery plants"; excludes cut flowers/greens, potted foliage/flowering plants, bedding and plants, and seeds.

4/ Includes only direct government payments.

5/ Includes customwork, gross cash rent, forest products, and other farm-related income.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 5a--Nursery crop farms reporting principal occupation is farming, by sales classes, and

by region and State, 1987

Region \$10,000- and State \$24,999		Less than \$10,000	-----Total value of agricultural sales-----				
			All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
			----- Number -----				
Northeast:			1,307	119	287	159	184
235		323					
	Connecticut		106	17	20	14	14
23		18					
	Maine		45	3	5	8	4
11		14					
	Massachusetts		116	9	26	11	22
16		32					
	New Hampshire		26	3	4	4	4
5		6					
	New Jersey		312	30	80	33	42
55		72					
	New York		282	27	68	35	43
40		69					
	Pennsylvania		360	23	72	47	51
73		94					
	Rhode Island		27	7	6	3	0
4		7					
	Vermont		33	2	4	4	4
8		11					
North Central:			1,218	113	271	170	171
216		277					
	Illinois		156	25	42	21	20
29		19					
	Indiana		100	6	27	9	18
15		25					
	Iowa		48	4	10	6	8
10		10					
	Kansas		41	4	11	6	6
5		9					
	Michigan		279	19	69	46	43
42		60					
	Minnesota		75	7	14	9	11
13		21					

	Missouri	68	8	14	8	6
15	17					
	Nebraska	25	1	8	2	3
3	8					
	North Dakota	14	1	3	5	1
1	3					
	Ohio	280	28	48	43	37
50	74					
	South Dakota	11	1	1	2	2
2	3					
	Wisconsin	121	9	24	13	16
31	28					
	South:	2,967	275	699	394	408
508	683					
	Alabama	101	13	28	12	7
17	24					
	Arkansas	47	2	8	8	4
9	16					
	Delaware	17	3	3	1	3
3	4					
	Florida	1,009	103	276	154	119
160	197					
	Georgia	131	8	38	18	16
26	25					
	Kentucky	65	6	16	7	12
14	10					
	Louisiana	134	4	26	20	25
21	38					
	Maryland	105	14	24	14	12
18	23					
	Mississippi	46	3	12	7	4
12	8					
	North Carolina	392	17	73	42	70
83	107					
	Oklahoma	47	7	14	5	7
7	7					
	South Carolina	105	11	26	15	13
20	20					
	Tennessee	307	32	58	37	44
49	87					
	Texas	277	30	65	34	37
43	68					
	Virginia	156	21	30	16	31
19	39					
	West Virginia	28	1	2	4	4
7	10					
	West:	1,702	246	460	201	192
259	344					
	Alaska	N/A	N/A	N/A	N/A	N/A
N/A	N/A					

	Arizona	64	16	24	3	4
6	11					
	California	675	153	204	74	66
91	87					
	Colorado	58	1	25	6	5
10	11					
	Hawaii	118	3	18	21	15
17	44					
	Idaho	40	1	9	9	5
4	12					
	Montana	20	1	2	3	4
4	6					
	Nevada	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	New Mexico	30	1	7	4	5
4	9					
	Oregon	468	51	130	59	50
80	98					
	Utah	25	2	3	3	3
8	6					
	Washington	192	17	36	17	32
32	58					
	Wyoming	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	United States	7,194	753	1,717	924	955
	1,218	1,627				

Appendix table 5b--Nursery crop farms reporting principal occupation is farming, by sales classes, and by

region and State, 1987

Region \$10,000- and State \$24,999		Less than \$10,000	-----Total value of agricultural				
			All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
farms-----			-----Percent of all				
Northeast:			44.6	4.1	9.8	5.4	6.3
8.0	11.0						
	Connecticut		55.2	8.9	10.3	7.3	7.3
12.0	9.4						
	Maine		53.6	3.6	5.9	9.5	4.8
13.1	16.7						
	Massachusetts		47.5	3.7	10.6	4.5	9.0
6.6	13.1						
	New Hampshire		44.1	5.1	6.7	6.8	6.8
8.5	10.2						
	New Jersey		41.1	4.0	10.6	4.3	5.5
7.2	9.5						
	New York		47.6	4.6	11.5	5.9	7.3
6.7	11.6						
	Pennsylvania		40.0	2.6	8.0	5.2	5.7
8.1	10.4						
	Rhode Island		69.2	17.9	15.4	7.7	0.0
10.3	17.9						
	Vermont		54.1	3.3	6.5	6.6	6.6
13.1	18.0						
North Central:			41.6	3.9	9.2	5.8	5.8
7.4	9.5						
	Illinois		43.0	6.9	11.6	5.8	5.5
8.0	5.2						
	Indiana		38.6	2.3	10.4	3.5	6.9
5.8	9.7						
	Iowa		39.0	3.3	8.1	4.9	6.5
8.1	8.1						
	Kansas		46.6	4.5	12.6	6.8	6.8
5.7	10.2						
	Michigan		42.1	2.9	10.4	6.9	6.5
6.3	9.1						
	Minnesota		35.7	3.3	6.7	4.3	5.2
6.2	10.0						

	Missouri	38.2	4.5	7.8	4.5	3.4
8.4	9.6					
	Nebraska	31.6	1.3	10.1	2.5	3.8
3.8	10.1					
	North Dakota	51.9	3.7	11.2	18.5	3.7
3.7	11.1					
	Ohio	44.3	4.4	7.6	6.8	5.9
7.9	11.7					
	South Dakota	32.4	2.9	3.0	5.9	5.9
5.9	8.8					
	Wisconsin	44.5	3.3	8.8	4.8	5.9
11.4	10.3					
	South:	46.8	4.3	11.1	6.2	6.4
8.0	10.8					
	Alabama	45.5	5.9	12.5	5.4	3.2
7.7	10.8					
	Arkansas	56.6	2.4	9.7	9.6	4.8
10.8	19.3					
	Delaware	48.6	8.6	8.5	2.9	8.6
8.6	11.4					
	Florida	51.4	5.2	14.2	7.8	6.1
8.1	10.0					
	Georgia	44.9	2.7	13.0	6.2	5.5
8.9	8.6					
	Kentucky	40.9	3.8	10.1	4.4	7.5
8.8	6.3					
	Louisiana	51.7	1.5	10.0	7.7	9.7
8.1	14.7					
	Maryland	41.5	5.5	9.6	5.5	4.7
7.1	9.1					
	Mississippi	46.5	3.0	12.2	7.1	4.0
12.1	8.1					
	North Carolina	42.5	1.8	7.9	4.6	7.6
9.0	11.6					
	Oklahoma	45.6	6.8	13.5	4.9	6.8
6.8	6.8					
	South Carolina	49.8	5.2	12.3	7.1	6.2
9.5	9.5					
	Tennessee	46.3	4.8	8.8	5.6	6.6
7.4	13.1					
	Texas	42.7	4.6	10.1	5.2	5.7
6.6	10.5					
	Virginia	44.1	5.9	8.5	4.5	8.8
5.4	11.0					
	West Virginia	39.4	1.4	2.8	5.6	5.6
9.9	14.1					
	West:	54.0	7.8	14.6	6.4	6.1
8.2	10.9					
	Alaska	N/A	N/A	N/A	N/A	N/A
N/A	N/A					

	Arizona	55.7	13.9	20.9	2.6	3.5
5.2	9.6					
	California	59.4	13.5	17.9	6.5	5.8
8.0	7.7					
	Colorado	44.3	0.8	19.1	4.6	3.8
7.6	8.4					
	Hawaii	60.2	1.5	9.2	10.7	7.7
8.7	22.4					
	Idaho	41.2	1.0	9.2	9.3	5.2
4.1	12.4					
	Montana	45.5	2.3	4.6	6.8	9.1
9.1	13.6					
	Nevada	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	New Mexico	44.8	1.5	10.4	6.0	7.5
6.0	13.4					
	Oregon	52.6	5.7	14.7	6.6	5.6
9.0	11.0					
	Utah	41.0	3.3	5.0	4.9	4.9
13.1	9.8					
	Washington	50.7	4.5	9.6	4.5	8.4
8.4	15.3					
	Wyoming	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	United States	46.9	4.9	11.3	6.0	6.2
7.9	10.6					

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 6--U. S. nursery crop farms: Number, area in production, sales, and net cash farm income, 1987

Net cash farm income		Floriculture/env.			Nursery plant		Sales	
		horticulture area			area		Floriculture/ horticulture	Nursery crop
Region and State	Farms	Under cover	In the open	Under cover	In the open			
Total	Per farm	Number	Square feet	Acres	Square feet	Acres	\$1,000	\$1,000
\$1,000	Dollars							
Northeast:		2,931	26,126,446	53,486	20,598,618	52,249	314,215	279,987
119,523	40,779							
Connecticut		192	10,242,519	7,242	9,944,074	7,171	57,458	55,755
16,367	85,245							
Maine		84	189,799	509	80,507	500	3,742	3,044
2,143	25,512							
Massachusetts		244	1,216,152	2,648	518,082	2,502	29,646	24,317
13,756	56,377							
New Hampshire		59	137,516	696	19,497	335	3,720	2,043
1,504	25,492							
New Jersey		759	6,513,413	13,581	5,001,908	13,463	73,036	64,241
35,649	46,968							
New York		593	2,249,170	10,877	1,236,833	10,770	57,320	52,455
19,914	33,582							
Pennsylvania		900	5,043,140	15,916	3,411,109	15,505	76,673	66,132
26,943	29,937							
Rhode Island		39	371,414	1,629	330,094	1,621	N. A.	10,388
N. A.	N. A.							
Vermont		61	163,323	389	56,514	382	2,118	1,613
837	13,721							
North Central:		2,927	19,172,337	69,175	13,006,559	63,330	339,255	296,789
108,969	37,229							
Illinois		363	1,581,353	14,487	760,225	13,584	63,587	59,147
22,592	62,237							
Indiana		259	684,842	4,456	193,790	4,276	18,936	16,441
7,621	29,425							
Iowa		123	697,783	3,290	308,350	3,159	15,334	13,599
4,771	38,789							
Kansas		88	422,277	2,427	67,704	1,410	6,922	3,864
890	10,114							
Michigan		662	8,074,835	13,257	7,104,974	12,176	85,619	75,248
21,610	32,644							
Minnesota		210	1,124,478	3,063	344,850	3,035	19,664	15,368
8,102	38,581							
Missouri		178	951,150	4,277	196,462	4,028	22,545	19,134
9,449	53,084							
Nebraska		79	109,740	1,405	11,580	1,280	3,756	3,199
1,780	22,532							

North Dakota	27	84, 251	337	7, 233	332	N. A.	1, 456
N. A.							
Ohio	632	4, 564, 050	15, 692	3, 685, 242	14, 161	74, 278	66, 196
21, 645	34, 248						
South Dakota	34	188, 185	676	12, 275	647	2, 343	1, 602
1, 016	29, 882						
Wisconsin	272	689, 393	5, 808	313, 844	5, 243	24, 464	21, 535
8, 588	31, 574						
South:	6, 340	63, 277, 221	105, 724	44, 148, 326	98, 271	766, 005	674, 680
292, 944	46, 206						
Alabama	222	5, 513, 858	5, 537	4, 773, 919	5, 054	61, 011	52, 396
26, 184	117, 946						
Arkansas	83	680, 162	598	478, 412	547	4, 132	3, 300
1, 952	23, 518						
Delaware	35	125, 972	774	114, 272	765	4, 568	4, 451
1, 804	51, 543						
Florida	1, 964	25, 740, 382	21, 366	16, 822, 250	18, 871	257, 059	226, 965
121, 759	61, 995						
Georgia	292	2, 173, 500	6, 094	1, 982, 258	3, 508	46, 775	40, 913
15, 589	53, 387						
Kentucky	159	658, 501	3, 264	370, 915	3, 069	12, 852	11, 692
4, 135	26, 006						
Louisiana	259	1, 664, 982	4, 840	1, 181, 820	4, 784	17, 559	15, 818
4, 822	18, 618						
Maryland	253	1, 340, 403	6, 697	527, 722	6, 170	33, 187	27, 049
6, 059	23, 949						
Mississippi	99	923, 858	616	606, 021	582	6, 129	5, 330
2, 963	29, 929						
North Carolin	923	4, 266, 012	8, 217	2, 447, 885	8, 132	52, 943	44, 949
22, 663	24, 554						
Oklahoma	103	2, 647, 948	3, 670	2, 271, 613	3, 132	37, 285	34, 461
6, 508	63, 184						
South Carolin	211	2, 032, 991	3, 236	1, 078, 171	3, 169	29, 701	24, 526
9, 086	43, 062						
Tennessee	663	2, 982, 341	22, 322	2, 447, 042	22, 160	66, 857	63, 454
23, 090	34, 827						
Texas	649	8, 824, 612	10, 188	6, 286, 371	10, 046	88, 538	76, 100
31, 959	49, 243						
Virginia	354	3, 324, 793	7, 896	2, 498, 305	7, 876	44, 111	40, 394
13, 608	38, 441						
West Virginia	71	376, 906	410	261, 350	409	3, 297	2, 882
732	10, 310						
West:	3, 154	46, 064, 061	49, 622	33, 093, 402	46, 806	842, 773	739, 553
306, 510	97, 181						
Alaska	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
N. A.	N. A.						
Arizona	115	862, 431	2, 138	440, 831	2, 125	33, 759	32, 838
13, 857	120, 496						
California	1, 137	30, 143, 824	21, 879	20, 602, 881	20, 142	580, 484	497, 126
219, 730	193, 254						

Colorado	131	634,398	1,535	372,548	1,426	15,385	13,663
3,436	26,229						
Hawaii	196	2,506,098	464	1,598,034	392	10,361	7,056
3,445	17,577						
Idaho	97	72,814	1,760	20,000	1,561	4,537	4,119
3,207	33,062						
Montana	44	99,511	337	26,967	327	2,293	1,951
72	1,636						
Nevada	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
N. A.	N. A.	New Mexico	67	1,164,852	829	1,052,045	829
6,593	6,064	1,552	23,164				
Oregon	889	8,181,434	16,205	7,405,011	16,021	145,077	138,396
48,383	54,424						
Utah	61	611,930	496	199,550	266	6,770	3,679
1,814	29,738						
Washington	379	1,620,841	3,758	1,336,487	3,502	35,855	33,690
10,213	26,947						
Wyoming	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
N. A.	N. A.						
United States	15,352	154,640,065	278,007	110,846,905	260,656	2,262,248	1,991,009
827,946	53,931						

N. A. = Not available.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 7--Northeast region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,

1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- \$24,999	Less than \$10,000					
Farms and land in farms:						
Farms	Number	2,931	133	353	232	321
612	1,280					
Total land in farms	Acres	210,797	57,416	53,496	18,476	17,187
22,810	41,412					
Floriculture/env. hort. area:						
Under cover	Sq. ft.	26,126,446	17,544,583	4,849,276	1,403,747	1,186,687
758,207	383,946					
In the open	Acres	53,486	26,463	13,167	3,766	2,960
3,522	3,609					
Nursery plant area:						
Under cover	Sq. ft.	20,598,618	15,556,343	2,828,550	847,055	642,316
445,341	279,013					
In the open	Acres	52,249	25,685	12,906	3,723	2,925
3,464	3,546					
Type of organization:						
Individual or family	Farms	2,102	22	167	136	221
468	1,088					
Partnership	Farms	260	13	44	27	33
55	88					
Corporate:						
Family-held	Farms	493	85	122	60	58
77	91					
Other than family-held	Farms	56	12	15	6	6
10	7					
Other	Farms	20	1	5	3	3
2	6					
Gross cash farm income 2/	\$1,000	350,132	226,142	76,585	16,752	11,995
11,070	7,584					
Livestock sales	\$1,000	3,134	356	298	282	634
443	1,120					
Crop sales	\$1,000	341,851	224,908	75,326	15,664	10,963
9,606	5,384					
Floriculture/env. hort	\$1,000	314,215	206,698	68,752	14,531	10,202
9,009	5,025					
Nursery plant sales	\$1,000	279,987	187,852	58,458	12,334	8,504
8,106	4,733					
Government payments	\$1,000	394	87	193	41	29
23	21					

Other farm-related income	\$1,000	4,753	791	768	765	369
998	1,059					
Total cash farm expenses	\$1,000	230,609	154,109	46,501	10,125	6,739
6,819	6,315					
Variable expenses	\$1,000	210,105	145,314	42,076	8,588	5,235
4,910	3,982					
Seeds, bulbs, and other	\$1,000	22,389	15,453	4,691	1,125	477
424	219					
Commercial fertilizer	\$1,000	5,749	3,327	1,284	458	210
256	214					
Agricultural chemicals	\$1,000	6,383	3,578	1,709	459	179
275	182					
Petroleum products	\$1,000	10,360	5,492	2,614	653	560
522	519					
Electricity	\$1,000	3,403	1,748	811	340	190
164	149					
Hired farm labor	\$1,000	91,529	67,655	19,416	2,432	1,004
766	255					
Contract labor	\$1,000	9,655	6,937	1,609	487	122
371	129					
Repair and maintenance	\$1,000	12,713	6,612	2,803	828	900
868	702					
Custom work	\$1,000	2,068	1,398	371	93	53
63	90					
Other expenses	\$1,000	45,856	33,114	6,768	1,713	1,540
1,201	1,523					
Fixed expenses	\$1,000	20,504	8,795	4,425	1,537	1,504
1,909	2,333					
Interest expense	\$1,000	10,713	5,058	2,350	779	788
933	804					
Cash rent	\$1,000	3,021	1,937	773	120	75
69	47					
Property taxes	\$1,000	6,770	1,800	1,302	638	641
907	1,482					
Net cash farm income 3/	\$1,000	119,523	72,033	30,084	6,627	5,256
4,251	1,269					
Average per farm	Dollars	40,779	541,602	85,224	28,565	16,374
6,946	991					
Capital assets:						
Value of land/buildings	\$1,000	1,032,986	344,263	186,356	74,731	96,813
140,966	189,857					
Average per acre	Dollars	4,900	5,996	3,484	3,081	5,096
8,105	4,694					
Average per farm	Dollars	361,184	2,588,444	527,921	285,233	310,298
236,918	154,355					
Value of machinery/equip.	\$1,000	128,747	35,921	32,074	11,587	13,714
15,691	19,760					

Average per farm	Dollars	45,017	270,083	90,861	44,226	43,956
26,371	16,065					

1/ Includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.
 cash farm income includes livestock sales, crop sales, government payments, and other farm related-income.
 3/ Gross cash farm
 farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 8--North Central region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,
1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- Less than \$24,999						
Farms and land in farms:						
Farms	Number	2,927	140	372	276	344
623						
1,172						
Total land in farms	Acres	254,160	69,218	61,904	30,032	23,648
28,439						
40,919						
Floriculture/env. hort. area:						
Under cover	Sq. ft.	19,172,337	11,948,828	4,221,195	1,235,547	814,253
642,479						
310,035						
In the open	Acres	69,175	38,120	15,051	5,159	3,456
3,804						
3,585						
Nursery plant area:						
Under cover	Sq. ft.	13,006,559	9,250,328	2,068,925	746,407	366,366
352,504						
222,029						
In the open	Acres	63,330	33,758	14,040	4,940	3,384
3,686						
3,523						
Type of organization:						
Individual or family	Farms	2,065	18	164	175	240
481						
987						
Partnership	Farms	239	6	41	31	25
55						
81						
Corporate:						
Family-held	Farms	533	102	145	62	67
72						
85						
Other than family-held	Farms	68	13	16	5	10
11						
13						
Other	Farms	22	1	6	3	2
4						
6						
Gross cash farm income 2/	\$1,000	362,966	230,505	81,181	21,158	12,927
10,814						
6,383						
Livestock sales	\$1,000	4,090	96	1,433	844	754
359						
604						
Crop sales	\$1,000	353,600	229,779	78,253	19,064	11,858
9,823						
4,824						
Floriculture/env. hort.	\$1,000	339,255	225,853	71,495	17,120	11,095
9,235						
4,456						
Nursery plant sales	\$1,000	296,789	200,954	59,317	14,305	9,657
8,360						
4,196						
Government payments	\$1,000	1,277	48	643	305	69
95						
118						

Other farm-related income	\$1,000	3,999	582	852	945	246
537	837					
Total cash farm expenses	\$1,000	253,997	169,430	54,075	10,199	8,517
6,262	5,515					
Variable expenses	\$1,000	230,635	156,891	49,016	8,839	7,497
4,659	3,735					
Seeds, bulbs, and other	\$1,000	31,261	23,585	4,920	1,154	631
648	322					
Commercial fertilizer	\$1,000	5,546	3,055	1,542	377	178
246	147					
Agricultural chemicals	\$1,000	5,725	2,989	1,549	420	251
349	166					
Petroleum products	\$1,000	9,900	4,454	3,005	839	528
471	602					
Electricity	\$1,000	3,425	1,674	996	206	148
189	212					
Hired farm labor	\$1,000	98,038	70,980	21,517	2,621	1,384
961	576					
Contract labor	\$1,000	8,234	5,747	1,660	192	396
131	107					
Repair and maintenance	\$1,000	14,615	7,151	4,291	805	892
620	855					
Custom work	\$1,000	2,175	1,285	434	185	87
124	59					
Other expenses	\$1,000	51,716	35,971	9,102	2,040	3,002
920	689					
Fixed expenses	\$1,000	23,362	12,539	5,059	1,360	1,020
1,603	1,780					
Interest expense	\$1,000	13,693	8,082	2,726	711	417
974	782					
Cash rent	\$1,000	4,367	2,921	1,009	194	93
72	78					
Property taxes	\$1,000	5,302	1,536	1,324	455	510
557	920					
Net cash farm income 3/	\$1,000	108,969	61,075	27,106	10,959	4,410
4,552	868					
Average per farm	Dollars	37,229	436,250	72,866	39,707	12,820
7,307	741					
Capital assets:						
Value of land/buildings	\$1,000	602,208	199,655	134,530	43,503	48,677
59,504	116,339					
Average per acre	Dollars	2,460	2,884	2,173	1,340	2,405
2,137	3,223					
Average per farm	Dollars	222,628	1,426,107	361,640	169,934	146,177
106,829	113,060					
Value of machinery/equipment	\$1,000	123,382	34,603	32,464	12,226	14,175
15,584	14,330					

Average per farm	Dollars	45,613	247,161	87,269	47,759	42,568
27,978	13,926					

1/ Includes Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and cash farm income includes livestock sales, crop sales, government payments, and other farm-related income.

3/ Gross cash farm farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 9--Southern region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,

1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- Less than \$24,999						
Farms and land in farms:						
Farms	Number	6,340	342	935	621	761
1,263	2,418					
Total land in farms						
83,297	98,084	Acres	709,685	231,704	159,816	84,774
						52,010
Floriculture/env. hort. area:						
Under cover	Sq. ft.	63,277,221	31,513,749	18,182,430	4,369,821	3,486,932
3,349,377	2,374,912					
In the open	Acres	105,724	53,391	27,783	7,695	5,656
5,493	5,705					
Nursery plant area:						
Under cover	Sq. ft.	44,148,326	21,086,556	12,622,723	3,257,818	2,593,502
2,650,525	1,937,202					
In the open	Acres	98,271	48,075	26,513	7,343	5,431
5,335	5,574					
Type of organization:						
Individual or family	Farms	4,237	57	396	358	481
899	2,046					
Partnership	Farms	690	29	124	82	115
158	182					
Corporate:						
Family-held	Farms	1,159	209	348	153	139
173	137					
Other than family-held	Farms	191	45	64	24	22
20	16					
Other	Farms	63	2	3	4	4
13	37					
Gross cash farm income 2/						
\$1,000		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
910,701		593,001	199,711	47,117	30,097	
24,337	16,438					
Livestock sales						
\$1,000		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
24,539		9,711	1,568	3,415	2,794	
2,756	4,294					
Crop sales						
\$1,000		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
876,826		581,348	196,150	42,836	26,292	
19,989	10,211					
Floriculture/env. hort.						
\$1,000		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
766,005		485,372	187,067	40,313	24,898	
18,835	9,520					
Nursery plant sales						
\$1,000		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
674,680		422,962	167,417	36,180	22,121	
17,227	8,773					
Government payments						
\$1,000		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
1,664		591	625	165	58	
163	62					

Other farm-related income	\$1,000	7,672	1,351	1,368	701	953
1,429	1,871					
Total cash farm expenses	\$1,000	617,757	422,314	124,354	25,931	16,308
15,249	13,601					
Variable expenses	\$1,000	566,274	394,676	112,877	22,394	13,715
12,271	10,341					
Seeds, bulbs, and other	\$1,000	45,508	30,458	10,787	1,835	1,018
879	531					
Commercial fertilizer	\$1,000	22,635	14,731	4,614	1,054	738
813	686					
Agricultural chemicals	\$1,000	25,369	17,574	4,676	1,169	609
750	591					
Petroleum products	\$1,000	22,133	11,338	5,956	1,433	1,190
1,143	1,074					
Electricity	\$1,000	10,745	5,576	2,892	740	590
456	492					
Hired farm labor	\$1,000	220,954	157,168	47,613	7,773	4,711
2,327	1,362					
Contract labor	\$1,000	38,500	27,595	7,454	1,565	575
782	529					
Repair and maintenance	\$1,000	33,043	20,023	7,089	1,995	1,105
1,437	1,394					
Custom work	\$1,000	10,352	8,158	1,347	257	182
242	166					
Other expenses	\$1,000	137,035	102,055	20,449	4,573	2,997
3,442	3,516					
Fixed expenses	\$1,000	51,483	27,638	11,477	3,537	2,593
2,978	3,260					
Interest expense	\$1,000	34,353	18,782	7,873	2,399	1,709
1,757	1,832					
Cash rent	\$1,000	6,321	3,884	1,414	326	265
299	133					
Property taxes	\$1,000	10,809	4,972	2,190	812	619
922	1,295					
Net cash farm income 3/	\$1,000	292,944	170,687	75,357	21,186	13,789
9,088	2,837					
Average per farm	Dollars	46,206	499,085	80,596	34,116	18,120
7,196	1,173					
Capital assets:						
Value of land/buildings	\$1,000	2,468,909	1,331,200	384,414	184,134	151,257
179,833	238,071					
Average per acre	Dollars	3,483	5,745	2,405	2,220	2,738
2,109	2,602					
Average per farm	Dollars	408,084	3,892,398	411,138	308,432	200,340
158,583	106,140					
Value of machinery/equipment	\$1,000	279,581	96,465	69,528	26,246	23,447
27,303	36,593					

Average per farm	Dollars	46,288	282,063	74,361	43,964	31,055
24,076	16,343					

1/ Includes Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas. 2/ Gross cash farm income includes livestock sales, government payments, and other farm-related income. 3/ Gross cash farm income less cash farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 10--Western region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,

1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- Less than \$24,999						
Farms and land in farms:						
Farms	Number	3,154	295	582	290	350
538 1,099						
Total land in farms	Acres	269,034	92,109	92,220	23,330	12,630
16,773 31,972						
Floriculture/env. hort. area:						
Under cover	Sq. ft.	46,064,061	31,455,881	9,786,993	1,561,375	1,227,430
1,156,665 875,717						
In the open	Acres	49,622	31,588	10,168	2,400	1,890
1,714 1,862						
Nursery plant area:						
Under cover	Sq. ft.	33,093,402	21,610,171	7,635,825	1,107,305	1,019,639
996,727 723,735						
In the open	Acres	46,806	29,827	9,440	2,282	1,850
1,588 1,818						
Type of organization:						
Individual or family	Farms	2,142	44	276	187	266
425 944						
Partnership	Farms	375	38	81	46	38
72 100						
Corporate:						
Family-held	Farms	500	164	184	48	37
28 39						
Other than family-held	Farms	111	48	37	5	6
8 7						
Other	Farms	26	1	4	4	3
5 9						
Gross cash farm income 2/						
\$1,000		918,754	735,168	132,954	21,895	12,603
9,987 6,095						
Livestock sales	\$1,000	7,135	137	2,984	1,471	230
1,399 914						
Crop sales	\$1,000	907,350	732,859	129,168	20,290	12,135
8,481 4,417						
Floriculture/env. hort.	\$1,000	842,773	686,133	115,729	18,118	10,957
7,792 4,043						
Nursery plant sales	\$1,000	739,553	598,835	103,856	15,648	10,103
7,335 3,775						
Government payments	\$1,000	1,122	648	363	21	29
4 57						

Other farm-related income	\$1,000	3,147	1,524	439	113	209
103	707					
Total cash farm expenses	\$1,000	612,244	493,297	87,484	11,931	8,613
4,873	6,045					
Variable expenses	\$1,000	559,896	454,504	79,836	10,413	6,911
3,975	4,253					
Seeds, bulbs, and other	\$1,000	51,989	42,837	7,314	951	506
176	206					
Commercial fertilizer	\$1,000	16,249	12,257	2,693	362	437
212	287					
Agricultural chemicals	\$1,000	19,361	15,518	2,513	376	340
286	328					
Petroleum products	\$1,000	19,935	13,811	4,165	713	469
279	497					
Electricity	\$1,000	11,634	8,855	1,761	387	218
158	254					
Hired farm labor	\$1,000	270,735	229,061	34,825	3,739	2,059
569	481					
Contract labor	\$1,000	25,270	19,024	4,754	358	459
426	249					
Repair and maintenance	\$1,000	26,458	19,428	4,510	890	688
384	559					
Custom work	\$1,000	5,402	4,096	847	191	101
62	105					
Other expenses	\$1,000	112,863	89,617	16,454	2,446	1,634
1,423	1,287					
Fixed expenses	\$1,000	52,348	38,793	7,648	1,518	1,702
898	1,792					
Interest expense	\$1,000	29,721	21,866	4,930	738	967
492	729					
Cash rent	\$1,000	12,842	10,479	1,447	448	229
66	174					
Property taxes	\$1,000	9,785	6,448	1,271	332	506
340	889					
Net cash farm income 3/	\$1,000	306,510	241,871	45,470	9,964	3,990
5,114	50					
Average per farm	Dollars	97,181	819,902	78,127	34,359	11,400
9,506	45					
Capital assets:						
Value of land/buildings	\$1,000	1,459,878	856,335	230,322	91,873	79,313
63,092	138,943					
Average per acre	Dollars	5,291	9,297	2,498	4,558	7,614
7,707	2,280					
Average per farm	Dollars	478,022	2,902,831	395,742	381,216	195,835
161,774	121,880					
Value of machinery/equipment	\$1,000	155,697	79,301	35,666	9,735	8,931
6,820	15,245					

Average per farm	Dollars	50,981	268,816	61,282	40,392	22,052
17,487	13,372					

1/ Includes Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and

2/ Gross cash farm income includes livestock sales, crop sales, government payments, and other farm-related income. 3/ Gross income less cash farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 11a--Capital Requirements for Two Sizes of Field Nurseries, Climatic Zones 7 and 8, 1984 1/2/

Item	Nursery Size			
	Small (50 ac)		Large (100 ac)	
	Cost	Percent of total	Cost	Percent of total
	\$1,000	%	\$1,000	%
Land/ w gravel roads	126	36	239	47
Buildings, inc. grnh	76	22	84	16
Machinery, equip.	147	42	191	37
Total	349	100	514	100

Appendix table 11b--Annual Fixed Costs for Two Sizes of Field Nurseries, Climatic Zones 7 and 8, 1984

Nursery Size	Total	Per acre of growing area 3/
--- (Dollars)---		
Small (50 acres)	133,005	3,325
Large (100 acres)	177,991	2,094

Appendix table 11c--Total Costs per Saleable Plant Based on One Acre of Production for Two Sizes of Field Nurseries by Size

Climatic Zones 7 and 8, 1984			
Plant Specie & Size	Nursery Size		
	Small (50 ac)	Large (100 ac)	
--- (Dollars)---			
Euonymus 18-24"	3.59	3.10	
Juni perus 18-24"	4.29	3.70	
Red Maple 1.5-1.75"	8.29	6.86	
Dogwood 4-5'	7.35	6.09	

1/ Nearly all of Georgia is in climatic zones 7 and 8.

2/ Information in table 1, 2, and 3 are derived from "Investment and Operating Costs for Field Nurseries," Climatic Zones 7 and 8. T.D. Phillips, and M.B. Badenhop, 1985. Proceedings SNA Research Conference.
3/ Based on actual production area of 40 acres for small and 85 acres for large nursery.

Source: "Field Nursery Stock Production in Georgia", Cooperative Extension University of Georgia, Bulletin 995, August 1988.

Appendix table 12--Cash Flow Model for Establishing 70 Acre Shade Tree Nursery

(10 acres set each year in a seven-year rotation, unadjusted for income taxes)

Year Numbers	1	2	3	4	5	6
7	8					
	Dollars					
Variable Costs:						
Manager 15,000 15,000	15,000	15,000	15,000	15,000	15,000	15,000
Labor 10,000 10,000	5,000	5,000	10,000	10,000	10,000	10,000
Fertilizer, lime 150 150	150	150	150	150	150	150
Machine operation 840 840	120	240	360	480	600	720
Spraying 2,400 2,400	400	800	1,200	1,600	2,000	2,400
Miscellaneous 3,000 3,000	500	1,000	1,500	2,000	2,500	3,000
Building depreciatio 624 624	624	624	624	624	624	624
Plant materials 18,500 18,500	18,500	18,500	18,500	18,500	18,500	18,500
Total current expens 50,164 50,164	39,944	40,964	46,984	48,004	49,024	50,044
Interest on operating capital 4% (1/2 year) 2,007 2,007	1,598	1,639	1,879	1,920	1,961	2,002
Annual Variable Cost 52,171 52,171	41,542	42,603	48,863	49,924	50,985	52,046
Annual interest (8%) on net operating expense previous year 8,334 889		3,333	6,997	11,466	15,200	15,045
Sales (standing trees) 175,914 175,914				14,723	68,117	150,852
Net unrecovered cost 11,107 135,739	(41,542)	(87,468)	(143,328)	(189,995)	(188,063)	(104,302)
Fixed Costs:						
Land \$40/acre 2,800 2,800	400	800	1,200	1,600	2,000	2,400
Machinery 1,500 1,500	1,500	1,500	1,500	1,500	1,500	1,500

Old buildings	2,344	2,344	2,344	2,344	2,344	2,344
2,344	2,344					
Total fixed costs	4,244	4,644	5,044	5,444	5,844	6,244
6,644	6,644					
Annual interest (8%) on unrecovered fixed costs		340	738	1,201	1,732	2,338
3,025	3,799					
Unrecovered fixed costs accumulated	4,244	9,228	15,010	21,655	29,231	37,813
47,482	57,925					
Net Total						
<u>Costs Accumulated</u>	<u>(45,786)</u>	<u>(96,696)</u>	<u>(158,338)</u>	<u>(211,650)</u>	<u>(217,294)</u>	<u>(142,115)</u>
<u>(36,375)</u>	<u>77,814</u>					

Source: P.L. Smeal, J.S. Coartney, and K.E. Loope. "The Economics of Establishing a Shade Tree Nursery," , Virginia Polytechnic Institute. 1974.

Appendix table 13

Scientific Name Index for Field-Grown Nursery Crops

Scientific Name Index for Field-Grown Nursery Crops

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Abelia grandiflora</i>	Glossy Abelia	Broadleaf evergreen shrub	6
<i>Abelia chinensis</i>		Broadleaf evergreen shrub	6
<i>Abelia uniflora</i>		Broadleaf evergreen shrub	6
<i>Abies concolor</i>	White or Concolor Fir	Coniferous evergreen tree	2
<i>Acer barbatum</i>	Florida Maple	Deciduous tree	9
<i>Acer buergerianum</i>	Trident Maple	Deciduous tree	5
<i>Acer campestre</i>	Hedge Maple	Deciduous tree	4
<i>Acer cappadocicum</i>	Coliseum Maple	Deciduous tree	6
<i>Acer dasycarpum</i>	Silver, Soft, or River Maple	Deciduous tree	4
<i>Acer floridanum</i>	Florida Maple	Deciduous tree	9
<i>Acer ginnala</i>	Amur Maple	Deciduous tree	2
<i>Acer giseum</i>	Paperbark Maple	Deciduous tree	5
<i>Acer grandidentatum</i>	Bigtooth Maple	Deciduous tree	6
<i>Acer miyabei</i>	Miyabe Maple	Deciduous tree	4 or 5
<i>Acer negundo</i>	Boxelder	Deciduous tree	2
<i>Acer palmatum</i>	Japanese Maple	Deciduous tree	5
<i>Acer platanoides</i>	Norway Maple	Deciduous tree	3
<i>Acer rubrum</i>	Red or Swamp Maple	Deciduous tree	3
<i>Acer saccharinum</i>	Silver, Soft, or River Maple	Deciduous tree	4
<i>Acer saccharum</i>	Sugar, Hard, or Rock Maple	Deciduous tree	3
<i>Aegopodium podogaria</i>	Goutweed or Bishop's Weed	Groundcover	4
<i>Aesculus arguta</i>	Texas Buckeye	Deciduous tree	5
<i>Aesculus glabra</i>	Ohio Buckeye	Deciduous tree	4
<i>Aesculus hippocastanum</i>	Horsechestnut	Deciduous tree	4
<i>Aesculus parviflora</i>	Bottlebrush Buckeye	Deciduous shrub	5
<i>Aesculus pavia</i>	Red Buckeye	Deciduous shrub	5
<i>Agave spp</i>	Agave	Broadleaf evergreen shrub	6
<i>Ailanthus altissima</i>	Tree-of-Heaven	Broadleaf evergreen shrub	4
<i>Ajuga reptans</i>	Carpetbugle, Ajuga, or Bugleweed	Groundcover	6
<i>Albizia julibrissin</i>	Mimosa or Silktree	Groundcover	6
<i>Alnus glutinosa</i>	Black Alder	Groundcover	3
<i>Alyssum saxatile</i>	Golden Alyssum or Basket-of-Gold	Groundcover	5
<i>Amelanchier arborea</i>	Downy Serviceberry	Deciduous tree	3
<i>Amelanchier grandiflora</i>	Apple serviceberry	Deciduous tree	3
<i>Amelanchier laevis</i>	Alleghy Serviceberry	Deciduous tree	3
<i>Aralia japonica</i>	Japanese Fatsia	Broadleaf evergreen shrub	8
<i>Araucaria bidwilli</i>	Monkey Puzzle tree	Narrowleaf evergreen shrub	7b-9
<i>Arecastrum spp</i>	Queen Palm	Broadleaf evergreen shrub	8b

<i>Arundinaria pigmaea</i>	Dwarf Bamboo	Broadleaf evergreen shrub	7
<i>Arundinaria variegata</i>	Dwarf white striped bamboo	Broadleaf evergreen shrub	6
<i>Aspidistra elatior</i>	Cast Iron Plant	Herbaceous perennial	8
<i>Aucuba japonica</i>	Japanese Aucuba or Gold Dust Plant	Broadleaf evergreen shrub	7
<i>Surinia saxatilis</i>	Golden Alyssum	Groundcover	5
<i>Azalea obtusum</i>	Kurume Azalea	Broadleaf evergreen shrub	6
<i>Bambusa spp</i>	Bamboo	Broadleaf evergreen shrub	6-7
<i>Bambusa multiplex</i>	Hedge Bamboo	Broadleaf evergreen shrub	6
<i>Berberis aquifolium</i>	Holly Grape	Broadleaf evergreen shrub	5
<i>Berberis julianae</i>	Wintergreen Barberry	Broadleaf evergreen shrub	6
<i>Berberis X gladwynensis</i>	William Penn Barberry	Broadleaf evergreen shrub	6
<i>Berberis mentorensis</i>	Mentor Barberry	Deciduous tree	3
<i>Berberis thunbergi</i>	Japanese Barberry	Deciduous tree	3
<i>Berberis verrucolosa</i>		Broadleaf evergreen shrub	6
<i>Betula alba</i>	European Birch	Deciduous tree	2
<i>Betula nigra</i>	River Birch	Deciduous tree	2
<i>Betula papyrifera</i>	Canoe or Paper Birch	Deciduous tree	2
<i>Betula pendula</i>	European Birch	Deciduous tree	2
<i>Betula verrucosa</i>	European Birch	Deciduous tree	2
<i>Broussonetia papyrifera</i>	Paper Mulberry	Deciduous tree	5
<i>Bumelia lanuginosa</i>	Chittinwood	Deciduous tree	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Butia capitata</i>	Pindo or Jelly Palm	Broadleaf evergreen shrub	8b
<i>Buxus harlandi</i>	Korean Box	Broadleaf evergreen shrub	5
<i>Buxus microphylla</i>	Japanese or Littleleaf Boxwood	Broadleaf evergreen shrub	5
<i>Buxus sempervirens</i>	English or Common Boxwood	Broadleaf evergreen shrub	5
<i>Callistemon citrinus</i>	Citrus-leaved Bottlebrush	Broadleaf evergreen shrub	9b-10
<i>Calocedrus decurrens</i>	California Incense Cedar	Coniferous evergreen tree	5
<i>Calycanthus floridus</i>	Sweetshrub	Deciduous shrub	5
<i>Camellia japonica</i>	Japanese Camellia	Broadleaf evergreen shrub	7b
<i>Camellia sasanqua</i>	Sasanqua Camellia	Broadleaf evergreen shrub	7
<i>Campsis grandiflora</i>	Chinese Trumpet Creeper	Deciduous vine	7
<i>Campsis radicans</i>	Trumpet Creeper	Deciduous vine	5
<i>Carpinus betulus</i>	European Hornbeam	Deciduous tree	4
<i>Carpinus caroliniana</i>	American Hornbeam or Blue Beech	Deciduous tree	3
<i>Caragana arborescens</i>	Siberian Pea Shrub	Deciduous shrub	2
<i>Caragana frutex</i>	Tussian Pean Shrub	Deciduous shrub	2
<i>Carya</i> spp.	Hickories	Deciduous tree	3-6
<i>Carya cordiformis</i>	Bitternut Hickory	Deciduous tree	4
<i>Carya illinoensis</i>	Pecan	Deciduous tree	5
<i>Carya ovata</i>	Shagbark Hickory	Deciduous tree	3-6
<i>Castanea dentata</i>	American Chestnut	Deciduous tree	4
<i>Castanea mollissima</i>	Chinese Chestnut	Deciduous tree	4
<i>Catalpa bignonioides</i>	Southern Catalpa	Deciduous tree	6
<i>Catalpa speciosa</i>	Northern Catalpa	Deciduous tree	6
<i>Cedrus atlantica</i>	Atlas Cedar	Coniferous evergreen tree	6
<i>Cedrus deodora</i>	Deodar Cedar	Coniferous evergreen tree	7
<i>Cedrus libani</i>	Cedar of Lebanon	Coniferous evergreen tree	6
<i>Celastrus orbiculatus</i>	Oriental Bittersweet	Deciduous shrub	5
<i>Celastrus scandens</i>	Amerbittersweet	Deciduous shrub	4
<i>Celtis occidentalis</i>	Hackberry	Deciduous tree	5
<i>Cephalotaxus harringtonia</i>	'Fastigiata'	Upright Plum Yew	6
<i>Cercidiphyllum japonicum</i>	Katsuratree	Deciduous tree	5
<i>Cercis canadensis</i>	Eastern Redbud	Deciduous tree	4
<i>Cercis chinensis</i>	Chinese Redbud	Deciduous tree	4
<i>Chaenomeles japonica</i>	Japanese Flowering Quince	Deciduous shrub	4

<i>Chaenomeles lagenaria</i>	Flowering Quince	Deciduous shrub	4
<i>Chaenomeles speciosa</i>	Flowering Quince	Deciduous shrub	4
<i>Chaenomeles</i> X ' <i>suberba</i> '		Deciduous shrub	4
<i>Chamaecyparis lawsoniana</i>	Lawson False Cypress 6	Coniferous evergreen tree	tree
<i>Chamaecyparis nootkatensis</i>	Nootka or Alaska Cypress 4	Coniferous evergreen tree	tree
<i>Chamaecyparis obtusa</i>	Hinoki False Cypress 5	Coniferous evergreen tree	tree
<i>Chamaecyparis pisifera</i>	Japanese False Cypress 5	Coniferous evergreen tree	tree
<i>Chamaerops humilis</i>	European Fan Palm	Broadleaf evergreen shrub	8
<i>Chilopsis linearis</i>	Desertwillow	Deciduous tree	7
<i>Cinnamomum camphora</i>	Chinese Fringetree	Deciduous tree	6
<i>Cionanthus retusus</i>	Chinese Fringetree	Deciduous tree	6
<i>Cinnamomum camphora</i>	Camphor tree	Broadleaf evergreen shrub	9
<i>Cladrastis lutea</i>	American Yellowwood	Deciduous tree	
<i>Clematis</i> spp.	<i>Clematis</i>	Deciduous vine	4
<i>Clematis</i> X " <i>Jackmani</i> "	Jackman Clematis	Deciduous vine	4
<i>Clematis paniculata</i>	Sweetautumn Clematis	Deciduous vine	4
<i>Clematis virginiana</i>	Woodbine or Virginsbower	Deciduous vine	4
<i>Cleyera japonica</i>	<i>Cleyera</i>	Broadleaf evergreen shrub	7
<i>Cocos australis</i>	Pindo or Jelly Palm	Broadleaf evergreen shrub	86
<i>Cocos nucifera</i>	Coconut	Broadleaf evergreen shrub	8
<i>Codiaeum variegatum</i>	Croton	Broadleaf evergreen shrub	8
<i>Cornus alba</i>		Deciduous shrub	2
<i>Cornus drummondii</i>	Roughleaf Dogwood	Deciduous tree	2

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Cornus florida</i>	Flowering Dogwood	Deciduous tree	4-5
<i>Cornus kousa</i>	Kousa Dogwood	Deciduous tree	5
<i>Cornus mas</i>	Corneliancherry Dogwood	Deciduous tree	5
<i>Cornus sericea</i>	Red-osier Dogwood	Deciduous shrub	2
<i>Cornus stolonifera</i>	Red-osier Dogwood	Deciduous shrub	2
<i>Cortaderia selloana</i>	Pampas Grass	Ornamental grass	7
<i>Cortinus coggygria</i>	Smoketree	Deciduous tree	3
<i>Cotoneaster</i> spp.	Cotoneaster	Deciduous shrub	4-7
<i>Cotoneaster dammeri</i>	Bearberry Cotoneaster	Deciduous shrub	6
<i>Cotoneaster divaricatus</i>	Spreading Cottoneaster	Deciduous shrub	5
<i>Cotoneaster horizontalis</i>	Rockspray Cottoneaster	Deciduous shrub	4
<i>Cotoneaster lucidus</i>	Hedge Cottoneaster	Deciduous shrub	5
<i>Cotoneaster multiflorus</i>	Many Flowered Cotoneaster	Deciduous shrub	3-6
<i>Crataegus</i> spp.	Hawthorn	Deciduous tree	3-6
<i>Crataegus crus-galli</i>	Cockspur Hawthorn	Deciduous tree	4
<i>Crataegus mollis</i>	Downy Hawthorn	Deciduous tree	4
<i>Crataegus X mordenensis</i>	Toba Hawthorn	Deciduous tree	4
<i>Crataegus oxyacantha</i>	Paul's Scarlet Hawthorn	Deciduous tree	4
<i>Crataegus phaenopyrum</i>	Washington Hawthorn	Deciduous tree	4
<i>Crataegus succulenta</i>		Deciduous tree	4
<i>Cryptomeria japonica</i>	Japanese Cryptomeria	Coniferous evergreen tree	6
<i>Cunninghamia lanceolata</i>	China Fir	Coniferous evergreen tree	7
<i>Cupressocyparis leylandi</i>	Leyland Cypress	Coniferous evergreen tree	6
<i>Cupressus arizonica</i>	Arizona Cypress	Coniferous evergreen tree	7
<i>Cupressus macrocarpa</i>	Monterey Cypress	Coniferous evergreen tree	6
<i>Cupressus sempervirens</i>	Italian Cypress	Coniferous evergreen tree	8
<i>Dasyliirion texanum</i>	Sotol or Bear Grass	Broadleaf evergreen shrub	8
<i>Deutzia gracilis</i>	Slender Deutzia	Deciduous shrub	5
<i>Deutzia X lemoinei</i>	Lemoinei Deutzia	Deciduous shrub	4
<i>Deutzia parviflora</i>		Deciduous shrub	4
<i>Diospyros kaki</i>	Oriental Persimon	Deciduous tree	7
<i>Diospyros virginiana</i>	Common Persimmon or Possumwood	Deciduous tree	4
<i>Elaeagnus Angustiflolia</i>	Russian Olive	Deciduous tree	2
<i>Elaeagnus macrophylla</i>	Silverberry	Broadleaf evergreen shrub	7

<i>Elaeagnus pungens</i>	Thorny Elaeagnus	Broadleaf evergreen shrub	7
<i>Erianthus ravennae</i>	Plume Grass	Ornamental grass	7
<i>Eriobotrya japonica</i>	Loquat	Broadleaf evergreen shrub	8
<i>Eucommia ulmoides</i>	Hardy Rubbertree	Deciduous tree	5
<i>Euonymus alata</i>	Winged Euonymus or Burning Bush	Deciduous tree	3
<i>Euonymus bungeana</i>	Wintervberry Euonymus	Deciduous tree	4
<i>Euonymus europaea</i>	European Spindle Tree	Deciduous tree	4
<i>Euonymus fortunei</i>	Evergreen Wintercreeper	Groundcover/vine/shrub	4
<i>Euonymus japonica</i>	Evergreen Euonymus	Broadleaf evergreen shrub	7
<i>Euonymus kiauutschovica</i>	Spreading Euonymus	Broadleaf evergreen shrub	6
<i>Euonymus patens</i>	Spreading Euonymum	Broadleaf evergreen shrub	6
<i>Euonymus radicans</i>	Evergreen Wintercreeper	Broadleaf evergreen shrub/vine groundcover	4
<i>Exochorda geraldii</i>		Deciduous tree	5
<i>Exochorda racemosa</i>	Pearlbush	Deciduous tree	5
<i>Fagus grandiflora</i>	American Beech	Deciduous tree	3
<i>Fagus sylvatica</i>	European Beech	Deciduous tree	3
<i>Fatshedera lizei</i>		Broadleaf evergreen shrub	8
<i>Fatsia japonica</i>	Japanese Fatsia	Broadleaf evergreen shrub	8
<i>Feijoa sellowiana</i>	Pineapple Guava or Feijoa	Broadleaf evergreen shrub	8
<i>Festuca ovina</i>	Sheep's or Blue Fescue	Ornamental grass	5
<i>Ficus caruca</i>	Common or Edible Fig	Deciduous tree	7b
<i>Ficus pumila</i>	Creeping Fig	Groundcover	8
<i>Forsythia spp.</i>	Forsythia or Goldenbell	Deciduous shrub	5
<i>Forsythia intermedia</i>		Deciduous shrub	5
<i>Forsythia japonica</i>		Deciduous shrub	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Forsythia suspensa</i>	Weeping Forsythia	Deciduous shrub	5
<i>Forsythia viridissima</i>		Deciduous shrub	5
<i>Franklinia alatamaha</i>	Franklin Tree	Deciduous tree	6
<i>Fraxinus americana</i>	White Ash	Deciduous tree	2
<i>Fraxinus excelsior</i>	European Ash	Deciduous tree	5
<i>Fraxinus pennsylvanica</i>	Green Ash	Deciduous tree	2
<i>Fraxinus quadrangulata</i>	Blue Ash	Deciduous tree	4
<i>Gardenia jasminoides</i>	Gardenia or Cape Jasmine	Broadleaf evergreen tree	8
<i>Gelsemium sempervirens</i>	Carolina Yellow Jessamine	Broadleaf evergreen vine	7
<i>Ginkgo biloba</i>	Ginkgo or Maidenhair Tree	Deciduous tree	4
<i>Gleditsia triacanthos</i>	Honeylocust	Deciduous tree	4
<i>Gordonia lasianthus</i>	Gordonia or Loblolly Bay	Broadleaf evergreen tree	7b
<i>Gymocladus dioica</i>	Kentucky Coffee Tree	Deciduous tree	4
<i>Halesia carolina</i>	Carolina Silverbell	Deciduous tree	5
<i>Halesia diptera</i>	Two-winged Silverbell	Deciduous tree	5
<i>Hamamelis vernalis</i>	Vernal Witchhazel	Deciduous tree	4
<i>Hedera canariensis</i>	Algerian Ivy	Groundcover/vine	8b-10
<i>Hedera helix</i>	English Ivy	Groundcover/vine	5
<i>Hesperaloe parviflora</i>	Red Yucca	Broadleaf evergreen shrub	7
<i>Hibiscus rosa-sinensis</i>	Chinese Hibiscus	Deciduous shrub	10
<i>Hibiscus syriacus</i>	Rose-of-Sharon or Shrub Althea	Deciduous shrub	5
<i>Hosta</i> spp.	Hosta or Plantain Lily	Herbaceous perennial	5-6
<i>Hosta decorata</i>		Herbaceous perennial	5-6
<i>Hosta fortunei</i>		Herbaceous perennial	5-6
<i>Hosta lancifolia</i>	Narrow-leaved Plantain Lily	Herbaceous perennial	5-6
<i>Hosta seiboldi</i>	Seersucker Plantain Lily	Herbaceous perennial	5-6
<i>Hydrangea macrophylla</i>	Garden Hydranges	Deciduous shrub	6
<i>Hydrangea paniculata</i>	Peegee Hydrangea	Deciduous shrub	4
<i>Hydrangea quercifolia</i>	Oakleaf Hydrangea	Deciduous shrub	4
<i>Hypericum kalmianum</i>	Kalm's St. Johns-wort	Deciduous shrub	4
<i>Hypericum patulum</i>	Goldcup St. Johns-wort	Deciduous shrub	5
<i>Hypericum prolificum</i>	Shrubby St. Johns-wort	Deciduous shrub	4
<i>Iberis sempervirens</i>	Evergreen Candytuft	Groundcover	5
<i>Ilex altaclarensis</i>		Broadleaf evergreen shrub	6
<i>Ilex aquifolium</i>	English Holly	Broadleaf evergreen shrub	6
<i>Ilex attenuata</i>		Broadleaf evergreen shrub	6
<i>Ilex cassine</i>		Broadleaf evergreen shrub	6
<i>Ilex cornuta</i>	Chinese or Horned Holly	Broadleaf evergreen shrub	6
<i>Ilex crenata</i>	Japanese Holly	Broadleaf evergreen shrub	6b

<i>Ilex decidua</i>	Possumhaw or Deciduous	Deciduous shrub	5
<i>Ilex latifolia</i>	Luster Leaf Holly	Broadleaf evergreen shrub	7
<i>Ilex X meserveae</i>	Blue Holly	Broadleaf evergreen shrub	6
<i>Ilex opaca</i>	American Holly	Broadleaf evergreen shrub	6
<i>Ilex perado</i>		Broadleaf evergreen shrub	6
<i>Ilex pernyi</i>	Pernyi Holly	Broadleaf evergreen shrub	6
<i>Ilex platyphylla</i>		Broadleaf evergreen shrub	6
<i>Ilex rotunda</i>	Round Holly	Broadleaf evergreen shrub	8
<i>Ilex verticillata</i>	Winterberry, Black Alder of Michigan Holly	Deciduous shrub	2
<i>Ilex vomitoria</i>	Yaupon Holly	Broadleaf evergreen shrub	6
<i>Illicium anisatum</i>	Japanese Anise	Broadleaf evergreen shrub	9
<i>Illicium floridanum</i>	Florida or Purple Anise	Broadleaf evergreen shrub	9
<i>Jasminum floridum</i>		Deciduous shrub	7
<i>Jasminum mesnyi</i>	Primrose Jasmine	Evergreen shrub	8
<i>Jasminum nudiflorum</i>	Winter Jasmine	Evergreen shrub	6
<i>Juglans nigra</i>	Black Walnut	Deciduous tree	4
<i>Juniperus chinensis</i>	Chinese Juniper	Evergreen tree	3
<i>Juniperus conferta</i>	Shore Juniper	Groundcover	6b-7
<i>Juniperus davurica</i>	Parson's Juniper	Groundcover	4
<i>Juniperus excelsa</i>	Spiny Greek Juniper	Evergreen tree	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Juniperus horizontalis</i>	Creeping Juniper	Groundcover	2
<i>Juniperus procumbens</i>	Japanese Garden Juniper	Groundcover	4
<i>Juniperus sabina</i>	Savin Juniper	Evergreen shrub	4
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	Evergreen shrub	4
<i>Juniperus squamata</i>	Meyer or Fishtain Juniper	Evergreen shrub	4
<i>Juniperus silicicola</i>		Narrowleaf evergreen tree	2
<i>Juniperus virginiana</i>	Eastern Redcedar	Narrowleaf evergreen tree	2
<i>Kerria japonica</i>	Japanese Kerria	Deciduous shrub	4
<i>Koelreuteria bipinnata</i>	Goldenrain Tree	Deciduous tree	7b-9
<i>Koelreuteria elegans</i>	Formosan Goldenrain Tree or Flamegold	Deciduous tree	9-10
<i>Koelreuteria formosana</i>	Goldenrain Tree	Deciduous tree	8
<i>Koelreuteria paniculate</i>	Panicled Goldenrain Tree	Deciduous shrub	5-7
<i>Kolkwitzia amabilis</i>	Beautybush	Deciduous shrub	5
<i>Lagerstroemia fauriei</i>		Deciduous shrub	5
<i>Lagerstroemia indica</i>	Crapemyrtle	Deciduous shrub	7
<i>Larix decidua</i>	European Larch	Deciduous shrub	3
<i>Larix laricina</i>	American Larch or Tamarack	Deciduous shrub	1
<i>Leucophyllum frutescens</i>	Texas Sage	Broadleaf evergreen shrub	8
<i>Libocedrus decurrens</i>	California Incense Cedar	Narrowleaf evergreen tree	5
<i>Ligustrum spp.</i>	Privet	Deciduous shrub	3-7
<i>Ligustrum japonicum</i>	Japanese or Wax Leaf Ligustrum	Broadleaf evergreen shrub	7b
<i>Ligustrum lucidum</i>		Broadleaf evergreen shrub/tree	7b
<i>Ligustrum obtusifolium</i>	Border Privet	Deciduous shrub	3
<i>Ligustrum ovalifolium</i>	California Privet	Deciduous shrub	5
<i>Ligustrum sinense</i>	Chinese Privet	Deciduous shrub	7
<i>Ligustrum texanum</i>	Wax Leaf Ligustrum	Broadleaf evergreen shrub	7b
<i>Ligustrum vicaryi</i>	Golden Vicary Privet	Deciduous shrub	4
<i>Ligustrum vulgare</i>	Common Privet	Deciduous shrub	4
<i>Liquidambar formosana</i>	Formosan Sweetgum	Deciduous shrub	4
<i>Liquidambar styraciflua</i>	Sweetgum	Deciduous shrub	4
<i>Liriodendron tulipifera</i>	Tulip Tree or Yellow Poplar	Deciduous shrub	4
<i>Liriope muscari</i>	Lily Turf, Monkey Grass, or Lirriope	Groundcover	6-7
<i>Lonicera alpigena</i>	Alps Honeysuckle	Deciduous shrub	3
<i>Lonicera fragrantissima</i>	Winter Honeysuckle	Deciduous shrub	5
<i>Lonicera japonica</i>	Japanese Honeysuckle	Broadleaf evergreen shrub	4
<i>Lonicera maackii</i>	Amur Honeysuckle	Deciduous shrub	3

<i>Lonicera morrowi</i>	Morrow Honeysuckle	Deciduous shrub	4
<i>Lonicera sempervirens</i>	Trumpet Honeysuckle	Semi-evergreen vine	4
<i>Lonicera tatarica</i>	Tatarian Honeysuckle	Deciduous shrub	3
<i>Lonicera X xylosteoides</i>	Clavey's Dwarf Honeysuckle	Deciduous shrub	3
<i>Maclura pomifera</i>	Osage Orange	Deciduous shrub	5
<i>Magnolia acuminata</i>	Cucumbertree Magnolia	Deciduous shrub	4
<i>Magnolia grandiflora</i>	Southern Magnolia or Bullbay	Broadleaf evergreen tree	7
<i>Magnolia heptapeta</i>		Deciduous tree	5
<i>Magnolia macrophylla</i>	Bigleaf Magnolia	Deciduous tree	5
<i>Magnolia quinquepeta</i>		Deciduous tree	5
<i>Magnolia soulangiana</i>	Saucer Magnolia	Deciduous tree	5
<i>Magnolia stellata</i>	Star Magnolia	Deciduous shrub	5
<i>Magnolia tripetala</i>	Umbrella Magnolia	Deciduous shrub	4
<i>Magnolia virginiana</i>	Sweetbay or Swamp Magnolia	Deciduous shrub	5
<i>Mahonia aquifolium</i>	Oregon Grape or Holly Grape Mahonia	Broadleaf evergreen shrub	5
<i>Mahonia bealei</i>	Leatherleaf Mahonia	Broadleaf evergreen shrub	6
<i>Mahonia fortunei</i>		Broadleaf evergreen shrub	8
<i>Mahonia lamariifolia</i>	Chinese Hollygrape	Broadleaf evergreen shrub	8
<i>Malus</i> spp.	Flowering Crabapple	Deciduous tree	3
<i>Malus baccata</i>		Deciduous tree	3
<i>Malus floribunda</i>		Deciduous tree	3

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Malus sargentii</i>		Deciduous tree	3
<i>Melia azedarach</i>	Chinaberry	Deciduous tree	7
<i>Metasequoia glyptostroboides</i>	Dawn Redwood	Deciduous tree	5
<i>Morus alba</i>	White Mulberry	Deciduous tree	3
<i>Morus rubra</i>	Red Mulberry	Deciduous tree	3
<i>Myrica cerifera</i>	Southern Wax Myrtle	Broadleaf evergreen tree	7
<i>Myrica pensylvanica</i>	Bayberry	Semi-evergreen shrub	5
<i>Mandina domestica</i>	Heavenly Bamboo or Nandina	Broadleaf evergreen shrub	6
<i>Nerium oleander</i>	Oleander	Broadleaf evergreen shrub	8
<i>Nyssa sylvatica</i>	Black Gum, Sour Gum, or Black Tupelo	Deciduous tree	4
<i>Ophiopogon japonicus</i>	Lily Turf or Mondograss	Groundcover	7
<i>Opuntia</i> spp.	Prickly Pear or Cholla Cactus	Broadleaf evergreen shrub	6
<i>Opuntia engelmannii</i>	Engelman Prickly Pear	Broadleaf evergreen shrub	6
<i>Opuntia imbricata</i>	Walking Stick Cholla	Broadleaf evergreen shrub	6
<i>Opuntia lindheimeri</i>	Lindheimer Prickly Pear	Broadleaf evergreen shrub	6
<i>Osmanthus X fortunei</i>	Fortunes Osmanthus	Broadleaf evergreen shrub	7
<i>Osmanthus fragrans</i>	Fragrant Tea Olive	Broadleaf evergreen shrub	7
<i>Osmanthus heterophyllus</i>	False Holly	Broadleaf evergreen shrub	7
<i>Osmanthus ilicifolius</i>	False Holly	Broadleaf evergreen shrub	7
<i>Ostrya virginiana</i>	American or Eastern Hophornbeam	Deciduous tree	3
<i>Oxydendrum arboreum</i>	Sourwood	Deciduous tree	5
<i>Pachysandra procumbens</i>	Alleghany Pachysandra	Groundcover	5
<i>Pachysandra terminalis</i>	Pachysandra or Japanese Surge	Groundcover	4
<i>Parkinsonia aculeata</i>	Parkinsonia or Jerusalem Thorn	Deciduous tree	9
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	Deciduous vine	2
<i>Parthenocissus tricuspidata</i>	Boston Ivy	Deciduous vine	2
<i>Paulownia tomentosa</i>	Royal Paulownia or Empress Tree	Deciduous tree	6b- 7
<i>Paxistima canbyi</i>	Cliff Green or Canby Paxistima	Groundcover	5
<i>Pennisetum alopecuroides</i>	Fountain Grass	Ornamental grass	5-6
<i>Pennisetum ruppelii</i>		Ornamental grass	5-6
<i>Phellodendron amurense</i>	Amur Corktree	Deciduous shrub	4
<i>Phellodendron chinense</i>	Chinese Corktree	Deciduous shrub	4
<i>Philadelphus coronarius</i>	Sweet Mockorange	Deciduous shrub	4
<i>Philadelphus X lemoinei</i>	Lemoine Mockorange	Deciduous shrub	4
<i>Philadelphus microphyllus</i>		Deciduous shrub	4
<i>Phlox subulata</i>	Moss Pink or Moss Phlox	Groundcover	5
<i>Photinia X 'Fraseri'</i>	Fraser's Photinia	Broadleaf evergreen shrub	7
<i>Photinia glabra</i>	Japanese Photinia	Broadleaf evergreen shrub	7
<i>Photinia serrulate</i>	Chinese Photinia	Broadleaf evergreen shrub	7

<i>Phyllostachys aureosulcata</i>	Yellowgroove Bamboo	Broadleaf evergreen shrub	7
<i>Physocarpus monogymus</i>	Mountain Ninebark	Deciduous shrub	4
<i>Physocarpus opulifolius</i>	Common Ninebark	Deciduous shrub	2
<i>Picea abies</i>	Norway Spruce	Coniferous evergreen tree	3
<i>Picea glauca</i> 'Densata'	Black Hills Spruce	Coniferous evergreen tree	2
<i>Picea pungens</i>	Colorado Blue Spruce	Coniferous evergreen tree	2
<i>Pinus cembroides</i>	Pinyon Pine	Coniferous evergreen tree	4
<i>Pinus densiflora</i>	Japanese Red Pine	Coniferous evergreen tree	5
<i>Pinus densiflora</i> 'Umbraculifera'	Tanyosho Pine	Coniferous evergreen tree	5
<i>Pinus echinata</i>	Shortleaf Pine	Coniferous evergreen tree	6
<i>Pinus elliotti</i>	Slash Pine	Coniferous evergreen tree	7
<i>Pinus flexilis</i>	Limber Pine	Coniferous evergreen tree	3
<i>Pinus glabra</i>	Spruce Pine	Coniferous evergreen tree	7
<i>Pinus mugo</i> (mugho)	Mugo Pine	Evergreen shrub/tree	3
<i>Pinus nigra</i>	Austrian Pine	Coniferous evergreen tree	4
<i>Pinus palustris</i>	Longleaf Pine	Coniferous evergreen tree	7
<i>Pinus pinaster</i>	Cluster or Maritime Pine	Coniferous evergreen tree	6
<i>Pinus ponderosa</i>	Ponderosa or Western Yellow Pine	Coniferous evergreen tree	5
<i>Pinus resinosa</i>	Red or Norway Pine	Coniferous evergreen tree	2
<i>Pinus strobiformis</i>	Western White Pine	Coniferous evergreen tree	3
<i>Pinus sylvestris</i>	Scotch (Scot's) Pine	Coniferous evergreen tree	

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Pinus taeda</i>	Loblolly Pine	Coniferous evergreen tree	6
<i>Pinus thunbergiana</i>	Japanese Black Pine	Coniferous evergreen tree	6
<i>Pinus thunbergi</i>	Japanese Black Pine	Coniferous evergreen tree	6
<i>Pistacia chinensis</i>	Chinese Pistache	Deciduous shrub	6
<i>Pistacia vera</i>	Pistacio	Deciduous shrub	8-9
<i>Pittosporum tobira</i>	Japanese Pittosporum or Mockorange	Broadleaf evergreen shrub	8
<i>Platanus X acerifolia</i>	London Planetree	Deciduous shrub	4
<i>Platanus occidentalis</i>	Sycamore or American Planetree	Deciduous shrub	3
<i>Platanus orientalis</i>	Oriental Planetree	Deciduous shrub	4
<i>Platyclusus orientalis</i>	Oriental Arborvitae	Evergreen shrub	5
<i>Podocarpus gracilior</i>	Fern Podocarpus	Evergreen shrub	10
<i>Podocarpus macrophyllus</i>	Yew Podocarpus	Evergreen shrub	8
<i>Podocarpus nagi</i>		Evergreen shrub	9-10
<i>Poncirus trifoliata</i>	Trifoliolate Orange	Deciduous shrub	6
<i>Populus alba</i>	White Poplar	Deciduous shrub	3
<i>Populus deltoides</i>	Eastern Cottonwood	Deciduous shrub	3
<i>Populus nigra 'Italica'</i>	Lombardy Poplar	Deciduous shrub	3
<i>Potentilla fruticosa</i>	Potentilla or Bush Cinquefoil	Deciduous shrub	2
<i>Prunus armeniaca</i>	Apricot	Deciduous shrub	5
<i>Prunus caroliniana</i>	Carolina Cherry Laurel	Broadleaf evergreen tree	7
<i>Prunus cerasifera</i>	Purpleleaf Plum	Deciduous shrub	3
<i>Prunus X cistena</i>	Purpleleaf Sand Cherry	Deciduous shrub	4
<i>Prunus glandulosa</i>	Flowering Almond	Deciduous shrub	4
<i>Prunus laurocerasus</i>	Cherry Laurel or English Laurel	Broadleaf evergreen tree	7
<i>Prunus persica</i>	Common Peach	Deciduous tree	5
<i>Prunus pumila</i>	Sand Cherry	Deciduous tree	4
<i>Prunus serotina</i>	Black Cherry	Deciduous tree	3
<i>Prunus serrulata</i>	Japanese Flowering Cherry	Deciduous tree	6
<i>Pseudotsuga menziesi</i>	Balsam Fir	Coniferous evergreen tree	4-6
<i>Punica granatum</i>	Pomegranate	Deciduous shrub	7
<i>Pyracantha coccinea</i>	Pyracantha or Firethorn	Broadleaf evergreen shrub	5-6
<i>Pyracantha koidzumi</i>	Formosa Pyracantha	Broadleaf evergreen shrub	8
<i>Pyrus calleryana</i>	Callery Pear	Deciduous tree	4
<i>Pyrus communis</i>	Common Pear	Deciduous tree	5
<i>Quercus spp.</i>	Oaks	Deciduous tree	3-6
<i>Quercus acutissima</i>	Sawtooth Oak	Deciduous tree	4
<i>Quercus alba</i>	White Oak	Deciduous tree	3
<i>Quercus bicolor</i>	Swamp White Oak	Deciduous tree	3
<i>Quercus borealis</i>	Northern Red Oak	Deciduous tree	3

<i>Quercus falcata</i>	Southern Red Oak	Deciduous tree	4
<i>Quercus imbricaria</i>	Shingle Oak	Deciduous tree	4
<i>Quercus laurifolia</i>	Laurel Oak	Deciduous tree	6
<i>Quercus macrocarpa</i>	Bur Oak	Deciduous tree	3
<i>Quercus marilandica</i>	Blackjack Oak	Deciduous tree	4
<i>Quercus muehlenbergi</i>	Chinquapin Oak, Yellow Chestnut Oak	Deciduous tree	3
<i>Quercus nigra</i>	Water Oak	Deciduous tree	6
<i>Quercus palustris</i>	Pin Oak	Deciduous tree	3
<i>Quercus phellos</i>	Willow Oak	Deciduous tree	4
<i>Quercus robur</i>	English Oak	Deciduous tree	4
<i>Quercus rubra</i>	Northern Red Oak	Deciduous tree	3
<i>Quercus shumardi</i>	Shumard Oak	Deciduous tree	3
<i>Quercus stellata</i>	Post Oak	Deciduous tree	4
<i>Quercus virginiana</i>	Live Oak	Broadleaftree	7
<i>Raphiolepis indica</i>	Indian Hawthorn	Broadleaf evergreen shrub	7b
<i>Raphiolepis umbellata</i>	Round Leaf Hawthorn	Broadleaf evergreen shrub	7b
<i>Rhamnus cathartica</i>	Common Buckthorn	Deciduous tree	2
<i>Rhamnus davurica</i>		Deciduous tree	5
<i>Rhamnus frangula</i>	Glossy Buckthorn	Deciduous tree	2
<i>Rhapidophyllum hystrix</i>	Needle Palm	Broadleaf evergreen shrub	7b
<i>Rhododendron spp.</i>	Evergreen Rhododendron	Broadleaf evergreen shrub	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Rhododendron catawbiense</i>	Catawba Rhododendron	Broadleaf evergreen shrub	5
<i>Rhododendron indicum</i>	Southern or Indica Azalea	Broadleaf evergreen shrub	7
<i>Rhododendron obtusum</i>	Kurume Azalea	Broadleaf evergreen shrub	6
<i>Rhododendron simsii</i>	Southern Azalea	Broadleaf evergreen shrub	7
<i>Rhodotypos scandens</i>	Black Jetbead	Deciduous shrub	5
<i>Rhus aromatica</i>	Fragrant Sumac	Deciduous shrub	4
<i>Rhus copallina</i>	Winged, Shining, or Planeleaf Sumac	Deciduous shrub	2
<i>Rhus glabra</i>	Smooth Sumac	Deciduous shrub	2
<i>Rhus typhina</i>	Staghorn or Velvet Sumac	Deciduous shrub	2
<i>Ribes alpinum</i>	Alpine Currant	Deciduous shrub	3
<i>Ribes cynosbati</i>	Prickly Gooseberry	Deciduous shrub	2
<i>Ribes hirtellum</i>	Common Gooseberry	Deciduous shrub	2
<i>Robinia pseudoacacia</i>	Black Locust	Deciduous tree	4
<i>Rosa</i> spp.	Rose	Deciduous shrub	4
<i>Rosa rugosa</i>	Rugosa Rose	Deciduous shrub	2
<i>Rosemarinus officinalis</i>	Rosemary	Narrowleaf evergreen shrub	7
<i>Sabal minor</i>	Bush Palmetto or Dwarf Palm	Broadleaftree	8b
<i>Sabal palmetto</i>	Sabal Palm	Broadleaftree	8b
<i>Salix alba</i>	Yellow-stemmed Weeping Willow	Deciduous tree	3
<i>Salix babylonica</i>	Weeping Willow	Deciduous tree	3
<i>Salix</i> X 'Blanda'		Deciduous tree	3
<i>Salix discolor</i>	Pussy Willow	Deciduous tree	2
<i>Salix gracilistyla</i>	Rosegold Pussy Willow	Deciduous shrub	2
<i>Salix matsudana</i> 'Tortuosa'	Corkscrew Willow	Deciduous tree	4
<i>Salix nigra</i>	Black Willow	Deciduous tree	3
<i>Santolina chamaecyparissus</i>	Gray Santolina	Groundcover	6
<i>Santolina virens</i>	Green Santolina	Groundcover	7
<i>Sapindus drummondii</i>	Western Soapberry	Deciduous tree	5
<i>Sapium sebiferum</i>	Chinese Tallow Tree	Deciduous tree	8
<i>Sassafras albidum</i>	Sassafras	Deciduous tree	5
<i>Sasa palmata</i>	Palmate Bamboo	Broadleaf evergreen shrub	6
<i>Sasa pigmaea</i>	Dwarf Bamboo	Broadleaf evergreen shrub	7
<i>Sedum acre</i>	Gold Moss Stonecrop	Groundcover	4
<i>Sedum spectabile</i>		Groundcover	4
<i>Sedum spurium</i>		Groundcover	3
<i>Serenoa repens</i>	Saw Palmetto	Broadleaf evergreen tree	8b
<i>Sophora japonica</i>	Japanese Pagoda Tree	Deciduous tree	4
<i>Sorbus aucuparia</i>	European Mountain Ash	Deciduous tree	3
<i>Spiraea albi flora</i>		Deciduous shrub	2

<i>Spiraea X arguta</i>	Garland Spiraea	Deciduous shrub	3
<i>Spiraea X bumalda</i>		Deciduous shrub	2
<i>Spiraea cantoniensis</i>	Reeves Spiraea	Deciduous shrub	3
<i>Spiraea japonica</i>	Japanese Spiraea	Deciduous shrub	5
<i>Spiraea X multiflora</i>		Deciduous shrub	3
<i>Spiraea prunifolia</i>	Bridal Wreath	Deciduous shrub	3
<i>Spiraea thunbergi</i>	Thunberg spiraea	Deciduous shrub	3
<i>Spiraea trilobata</i>		Deciduous shrub	3
<i>Spiraea X vanhouttei</i>	Vanhoutte Spiraea	Deciduous shrub	3
<i>Syringa afghinaca</i>		Deciduous shrub	3
<i>Syringa amurensis</i>	Japanese Tree Lilac	Deciduous tree	3
<i>Syringa X chinensis</i>	Chinese Lilac	Deciduous shrub	3
<i>Syringa laciniata</i>	Cutleaf Lilac	Deciduous shrub	3
<i>Syringa meyeri</i>	Meyer Lilac	Deciduous shrub	3
<i>Syringa pekinensis</i>	Chinese or Pekin Tree Lilac	Deciduous tree	3
<i>Syringa persica</i>	Persian Lilac	Deciduous shrub	5
<i>Syringa reticulata</i>	Japanese Tree Lilac	Deciduous tree	3
<i>Syringa vulgaris</i>	Common Lilac	Deciduous shrub	3
<i>Taxodium ascendens</i>	Pond Cypress	Deciduous tree	4
<i>Taxodium distichum</i>	Bald Cypress	Deciduous tree	4

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Taxus</i> spp.	Yew	Evergreen shrub	4-6
<i>Taxus baccata</i>	English Yew	Evergreen shrub	6
<i>Taxus capitata</i>	Japanese Yew	Evergreen shrub	4
<i>Taxus cuspidata</i>	Japanese Yew	Evergreen shrub	4
<i>Taxus media</i>	Hybrid yews	Evergreen shrub	4
<i>Ternstroemia japonica</i>	Japanese Cleyers	Broadleaf evergreen shrub	7
<i>Thuja occidentalis</i>	Oriental or Chinese Arborvitae	Narrowleaf evergreen tree	7
<i>Tilia americana</i>	American Linden or Basswood	Deciduous tree	3
<i>Tilia X euchlora</i> 'Redmond'		Deciduous tree	3
<i>Tilia cordata</i>	European Littleleaf Linden	Deciduous tree	3
<i>Tilia tomentosa</i>	Silver Linden	Deciduous tree	4
<i>Trachelospermum asiaticum</i>	Japanese Star Jasmine	Groundcover/vine	8
<i>Trachelospermum jasminoides</i>	Confederate or Star Jasmine	Groundcover/vine	8
<i>Trachycarpus fortunei</i>	Windmill Palm	Broadleaf evergreen tree	8
<i>Tsuga canadensis</i>	Canadian or Eastern Hemlock	Coniferous evergreen tree	3
<i>Tsuga caroliniana</i>	Carolina Hemlock	Coniferous evergreen tree	5
<i>Ulmus alata</i>	Winged Elm	Deciduous tree	6
<i>Ulmus americana</i>	American Elm	Deciduous tree	2
<i>Ulmus crassifolia</i>	Cedar Elm	Deciduous tree	6
<i>Ulmus japonica</i>	Japanese Elm	Deciduous tree	2
<i>Ulmus parvifolia</i>	Lacebark or Chinese Elm	Deciduous tree	4-5
<i>Ulmus pumila</i>	Siberian Elm	Deciduous tree	3
<i>Ulmus sempervirens</i>	Lacebark Elm	Deciduous tree	4-5
<i>Viburnum</i> spp.	Viburnum	Deciduous shrub	4-5
<i>Viburnum X</i> 'Burkwoodi'	Burkwood Viburnum	Deciduous shrub	5
<i>Viburnum carlesii</i>	Koreanspice or Mayflower Viburnum		Deciduous shrub
	5		
<i>Viburnum dentatum</i>	Arrowwood viburnum	Deciduous shrub	3
<i>Viburnum lantana</i>	Wayfaringtree Viburnum	Deciduous shrub	3
<i>Viburnum lentago</i>	Nannyberry Viburnum	Deciduous shrub	3
<i>Viburnum odoratissimum</i>	Sweet Viburnum	Broadleaf evergreen shrub	8
<i>Viburnum opulus</i>	European Cranberrybush Viburnum	Broadleaf evergreen shrub	3
<i>Viburnum plicatum</i>	Doublefile Viburnum	Deciduous shrub	5
<i>Viburnum rhytidophyloides</i>		Broadleaf evergreen shrub	6
<i>Viburnum rhytidophyllum</i>	Leatherleaf Viburnum	Broadleaf evergreen shrub	5
<i>Viburnum sieboldi</i>	Siebold Viburnum	Deciduous shrub	5
<i>Viburnum suspensum</i>	Sandanqua Viburnum	Broadleaf evergreen shrub	8
<i>Viburnum tinus</i>	Laurestinus	Broadleaf evergreen shrub	8
<i>Viburnum trilobum</i>	American Cranberrybush Viburnum	Deciduous shrub	2

<i>Viburnum utile</i>		Deciduous shrub	5
<i>Vinca major</i>	Periwinkle	Ground cover	6
<i>Vinca minor</i>	Common Periwinkle	Ground cover	3
<i>Vitex agnus-castus</i>	Chaste Tree	Deciduous shrub	6
<i>Vitex negundo</i>		Deciduous shrub	6
<i>Washington filifera</i>	Washington Palm	Broadleaf tree	8
<i>Washington robusta</i>	Mexican Palm	Broadleaf tree	8
<i>Weigela florida</i>	Weigela	Deciduous shrub	4-5
<i>Wisteria floribunda</i>	Japanese Wisteria	Deciduous shrub	5
<i>Xanthoceras sorbifolium</i>	Popcorn Shrub	Deciduous shrub	6
<i>Yucca aloifolia</i>	Spanish Bayonet	Broadleaf evergreen shrub	6
<i>Yucca elephantipes</i>		Broadleaf evergreen shrub	9b-10
<i>Yucca filamentosa</i>	Adam's Needle Yucca	Broadleaf evergreen shrub	4
<i>Yucca gloriosa</i>	Mound Lily Yucca	Broadleaf evergreen shrub	6
<i>Yucca parviflora</i>	Red Yucca	Broadleaf evergreen shrub	7
<i>Zelkova serrata</i>	Japanese Zelkova	Deciduous tree	4
<i>Ziziphus jujuba</i>	Jujube or False Date	Deciduous tree	7

Appendix table 2a--Nursery crop farms: Number of farms, by size of farm and by region and State, 1987

Region Less than and State <u>\$10,000</u>	All farms	-----Total value of agricultural sales-----				
		\$500,000 or more	\$100,000 - \$499,999	\$50,000 - \$99,999	\$25,000 - \$49,999	\$10,000 - \$24,999
Northeast: 1,280	2,931	133	353	232	321	612
Connecticut 60	192	19	23	17	22	51
Maine 39	84	3	5	8	8	21
Massachusetts 102	244	12	30	19	33	48
New Hampshire 25	59	3	5	6	8	12
New Jersey 348	759	33	93	49	78	158
New York 238	593	28	80	57	76	114
Pennsylvania 427	900	28	101	68	86	190
Rhode Island 15	39	7	7	3	2	5
Vermont 26	61	2	7	5	8	13
North Central: 1,172	2,927	140	372	276	344	623
Illinois 112	363	33	61	39	44	74
Indiana 103	259	9	41	14	34	58
Iowa 49	123	4	18	12	12	28
Kansas 39	88	4	11	6	8	20
Michigan 252	662	23	85	73	83	146
Minnesota 99	210	10	24	12	28	37
Missouri 70	178	10	25	16	20	37
Nebraska 47	79	2	9	6	7	8
North Dakota 9	27	1	4	6	4	3

	Ohio	632	32	61	70	63	140
266							
	South Dakota	34	1	5	4	5	8
11							
	Wisconsin	272	11	28	18	36	64
115							
South: 2,418		6,340	342	935	621	761	1,263
	Alabama	222	18	41	24	18	42
79							
	Arkansas	83	2	10	10	11	12
38							
	Delaware	35	4	4	3	6	6
12							
	Florida	1,964	131	368	250	253	360
602							
	Georgia	292	10	50	35	27	63
107							
	Kentucky	159	8	24	14	19	36
58							
	Louisiana	259	7	32	24	35	47
114							
	Maryland	253	16	31	20	23	66
97							
	Mississippi	99	4	16	10	11	28
30							
	North Carolina	923	20	89	59	117	215
423							
	Oklahoma	103	8	19	6	12	24
34							
	South Carolina	211	13	36	16	23	46
77							
	Tennessee	663	38	74	57	69	118
307							
	Texas	649	39	91	65	80	131
243							
	Virginia	354	23	45	22	48	53
163							
	West Virginia	71	1	5	6	9	16
34							
West: 1,099		3,154	295	582	290	350	538
	Alaska	N/A	N/A	N/A	N/A	N/A	N/A
N/A							
	Arizona	115	19	33	6	12	16
29							
	California	1,137	186	273	102	124	183
269							
	Colorado	131	4	32	12	15	20
48							
	Hawaii	196	3	23	24	19	33
94							

Idaho	97	1	11	13	7	9
56 Montana	44	1	3	6	7	10
17 Nevada	N/A	N/A	N/A	N/A	N/A	N/A
N/A New Mexico	67	3	11	7	8	11
27 Oregon	889	54	147	81	94	166
347 Utah	61	4	5	7	3	13
29 Washington	379	20	39	26	55	71
168 Wyoming	N/A	N/A	N/A	N/A	N/A	N/A
N/A						
United States	15,352	910	2,242	1,419	1,776	3,036
5,969						

Source: 1987 Census of Agriculture.

Table 2b--Size distribution of farms producing nursery crops, by region and State, 1987

		-----Total value of agricultural sales-----				
Region	All farms	\$500,000	\$100,000 -	\$50,000 -	\$25,000 -	\$10,000 -
Less than		or more	\$499,999	\$99,999	\$49,999	\$24,999
and State						
<u>\$10,000</u>						
		-----Percent of farms-----				
Northeast:	2,931	4.5	12.0	7.9	11.0	20.9
43.7						
Connecticut	192	9.9	12.0	8.9	11.5	26.6
31.3						
Maine	84	3.6	6.0	9.5	9.5	25.0
46.4						
Massachusetts	244	4.9	12.3	7.8	13.5	19.7
41.8						
New Hampshire	59	5.1	8.5	10.2	13.6	20.3
42.4						
New Jersey	759	4.3	12.3	6.5	10.3	20.8
45.8						
New York	593	4.7	13.5	9.6	12.8	19.2
40.1						
Pennsylvania	900	3.1	11.2	7.6	9.6	21.1
47.4						
Rhode Island	39	17.9	17.9	7.7	5.1	12.8
38.5						
Vermont	61	3.3	11.5	8.2	13.1	21.3
42.6						
North Central:	2,927	4.8	12.7	9.4	11.8	21.3
40.0						
Illinois	363	9.1	16.8	10.7	12.1	20.4
30.9						
Indiana	259	3.5	15.8	5.4	13.1	22.4
39.8						
Iowa	123	3.3	14.6	9.8	9.8	22.8
39.8						
Kansas	88	4.5	12.5	6.8	9.1	22.7
44.3						
Michigan	662	3.5	12.8	11.0	12.5	22.1
38.1						
Minnesota	210	4.8	11.4	5.7	13.3	17.6
47.1						
Missouri	178	5.6	14.0	9.0	11.2	20.8
39.3						
Nebraska	79	2.5	11.4	7.6	8.9	10.1
59.5						
North Dakota	27	3.7	14.8	22.2	14.8	11.1
33.3						

	Ohio	632	5.1	9.7	11.1	10.0	22.2
42.1							
	South Dakota	34	2.9	14.7	11.8	14.7	23.5
32.4							
	Wisconsin	272	4.0	10.3	6.6	13.2	23.5
42.3							
South:		6,340	5.4	14.7	9.8	12.0	19.9
38.1							
	Alabama	222	8.1	18.5	10.8	8.1	18.9
35.6							
	Arkansas	83	2.4	12.0	12.0	13.3	14.5
45.8							
	Delaware	35	11.4	11.4	8.6	17.1	17.1
34.3							
	Florida	1,964	6.7	18.7	12.7	12.9	18.3
30.7							
	Georgia	292	3.4	17.1	12.0	9.2	21.6
36.6							
	Kentucky	159	5.0	15.1	8.8	11.9	22.6
36.5							
	Louisiana	259	2.7	12.4	9.3	13.5	18.1
44.0							
	Maryland	253	6.3	12.3	7.9	9.1	26.1
38.3							
	Mississippi	99	4.0	16.2	10.1	11.1	28.3
30.3							
	North Carolina	923	2.2	9.6	6.4	12.7	23.3
45.8							
	Oklahoma	103	7.8	18.4	5.8	11.7	23.3
33.0							
	South Carolina	211	6.2	17.1	7.6	10.9	21.8
36.5							
	Tennessee	663	5.7	11.2	8.6	10.4	17.8
46.3							
	Texas	649	6.0	14.0	10.0	12.3	20.2
37.4							
	Virginia	354	6.5	12.7	6.2	13.6	15.0
46.0							
	West Virginia	71	1.4	7.0	8.5	12.7	22.5
47.9							
West:		3,154	9.4	18.5	9.2	11.1	17.1
34.8							
	Alaska	N/A	N/A	N/A	N/A	N/A	N/A
N/A							
	Arizona	115	16.5	28.7	5.2	10.4	13.9
25.2							
	California	1,137	16.4	24.0	9.0	10.9	16.1
23.7							
	Colorado	131	3.1	24.4	9.2	11.5	15.3
36.6							
	Hawaii	196	1.5	11.7	12.2	9.7	16.8
48.0							

Idaho	97	1.0	11.3	13.4	7.2	9.3	
57.7	Montana	44	2.3	6.8	13.6	15.9	22.7
38.6	Nevada	N/A	N/A	N/A	N/A	N/A	
N/A	New Mexico	67	4.5	16.4	10.4	11.9	16.4
40.3	Oregon	889	6.1	16.5	9.1	10.6	18.7
39.0	Utah	61	6.6	8.2	11.5	4.9	21.3
47.5	Washington	379	5.3	10.3	6.9	14.5	18.7
44.3	Wyoming	N/A	N/A	N/A	N/A	N/A	
N/A							
United States	15,352	5.9	14.6	9.2	11.6	19.8	
38.9							

Source: 1987 Census of Agriculture.

Appendix table 3--Organizational type of farms growing nursery crops,
by sales class and region, 1987

Organizational type and region	All farms	-----Total value of agricultural sales-----				
		\$500,000 or more	\$100,000 to \$499,999	\$50,000 to \$99,999	\$25,000 to \$49,999	Less than \$25,000
-----Number of farms-----						
Individual or family						
Northeast	2,102	22	167	136	221	1,556
North Central	2,065	18	164	175	240	1,468
South	4,237	57	396	358	481	2,945
West	2,142	44	276	187	266	1,369
U.S.	10,546	141	1,003	856	1,208	7,338
Partnership						
Northeast	260	13	44	27	33	143
North Central	239	6	41	31	25	136
South	690	29	124	82	115	340
West	375	38	81	46	38	172
U.S.	1,564	86	290	186	211	791
Corporation						
Family-held						
Northeast	493	85	122	60	58	168
North Central	533	102	145	62	67	157
South	1,159	209	348	153	139	310
West	500	164	184	48	37	67
U.S.	2,685	560	799	323	301	702
Other than family-held						
Northeast	56	12	15	6	6	17
North Central	68	13	16	5	10	24
South	191	45	64	24	22	36
West	111	48	37	5	6	15
U.S.	426	118	132	40	44	92
Other						
Northeast	20	1	5	3	3	8
North Central	22	1	6	3	2	10
South	63	2	3	4	4	50
West	26	1	4	4	3	14
U.S.	131	5	18	14	12	82

Source: 1987 U.S. Census of Agriculture.

Appendix table 4a--Sales of farms growing nursery crops, by sales classes and regions, 1987

Item and region \$10,000- Less than		All farms	-----Total value of agricultural sales-----			
			\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$24,999	\$10,000					
		----- \$1,000 -----				

Gross cash farm income: 1/						
Northeast		350,132	226,142	76,532	16,809	11,995
11,070	7,584					
North Central		362,966	230,505	81,179	21,158	12,927
10,814	6,383					
South		910,701	593,001	199,711	47,117	30,097
24,337	16,438					
West		918,754	735,168	133,006	21,895	12,603
9,987	6,095					
U. S.		2,542,553	1,784,816	490,428	106,979	67,622
56,208	36,500					
Livestock sales: 2/						
Northeast		3,134	356	299	282	634
443	1,120					
North Central		4,090	96	1,433	844	754
359	604					
South		24,539	9,711	1,569	3,415	2,794
2,756	4,294					
West		7,135	137	2,984	1,471	230
1,399	914					
U. S.		38,898	10,300	6,285	6,012	4,412
4,957	6,932					
Crop sales:						
Northeast		341,851	224,908	75,326	15,664	10,963
9,606	5,384					
North Central		353,600	229,779	78,252	19,064	11,858
9,823	4,824					
South		876,826	581,348	196,150	42,836	26,292
19,989	10,211					
West		907,350	732,859	129,168	20,290	12,135
8,481	4,417					
U. S.		2,479,627	1,768,894	478,896	97,854	61,248
47,899	24,836					
Nursery crop sales: 3/						
Northeast		279,987	187,852	58,458	12,334	8,504
8,106	4,733					
North Central		296,789	200,954	59,317	14,305	9,657
8,360	4,196					

South		674,680	422,962	167,417	36,180	22,121
17,227	8,773					
West		739,553	598,835	103,857	15,648	10,103
7,335	3,775					
U. S.		1,991,009	1,410,603	389,049	78,467	50,385
41,028	21,477					
Government payments: 4/						
Northeast		394	87	193	41	29
23	21					
North Central		1,277	48	642	305	69
95	118					
South		1,664	591	625	165	58
163	62					
West		1,122	648	363	21	29
4	57					
U. S.		4,457	1,374	1,823	532	185
285	258					
Other farm-related payments: 5/						
Northeast		4,753	791	714	822	369
998	1,059					
North Central		3,999	582	852	945	246
537	837					
South		7,672	1,351	1,367	701	953
1,429	1,871					
West		3,147	1,524	491	113	209
103	707					
U. S.		19,571	4,248	3,424	2,581	1,777
<u>3,067</u>	<u>4,474</u>					

See footnotes at end of table 3b.

Appendix table 4b--Sales of farms growing nursery crops, by sales classes and regions, 1987

Item and region \$10,000- Less than		-----Total value of agricultural sales-----				
		All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
<u>\$24,999</u> <u>\$10,000</u>						
		-----Percent of region income-----				

Gross cash farm income:						
Northeast		100.0	64.6	21.9	4.8	3.4
3.2	2.2					
North Central		100.0	63.5	22.4	5.8	3.6
3.0	1.8					
South		100.0	65.1	21.9	5.2	3.3
2.7	1.8					
West		100.0	80.0	14.5	2.4	1.4
1.1	0.7					
U. S.		100.0	70.2	19.3	4.2	2.7
2.2	1.4					
		-----Percent of gross income-----				

Livestock sales:						
Northeast		0.9	0.2	0.4	1.7	5.3
4.0	14.8					
North Central		1.1	0.0	1.8	4.0	5.8
3.3	9.5					
South		2.7	1.6	0.8	7.2	9.3
11.3	26.1					
West		0.8	0.0	2.2	6.7	1.8
14.0	15.0					
U. S.		1.5	0.6	1.3	5.6	6.5
8.8	19.0					
		-----Percent of gross income-----				

Crop sales:						
Northeast		97.6	99.5	98.4	93.2	91.4
86.8	71.0					
North Central		97.4	99.7	96.4	90.1	91.7
90.8	75.6					
South		96.3	98.0	98.2	90.9	87.4
82.1	62.1					
West		98.8	99.7	97.1	92.7	96.3
84.9	72.5					
U. S.		97.5	99.1	97.6	91.5	90.6
85.2	68.0					
		-----Percent of crop sales-----				

Nursery crop sales:						
Northeast		81.9	83.5	77.6	78.7	77.6
84.4	87.9					
North Central		83.9	87.5	75.8	75.0	81.4
85.1	87.0					
South		76.9	72.8	85.4	84.5	84.1
86.2	85.9					
West		81.5	81.7	80.4	77.1	83.3
86.5	85.5					
U. S.		80.3	79.7	81.2	80.2	82.3
85.7	86.5					

-----Percent of gross income-----

Nursery crop sales:						
Northeast		80.0	83.1	76.4	73.4	70.9
73.2	62.4					
North Central		81.8	87.2	73.1	67.6	74.7
77.3	65.7					
South		74.1	71.3	83.8	76.8	73.5
70.8	53.4					
West		80.5	81.5	78.1	71.5	80.2
73.4	61.9					
U. S.		78.3	79.0	79.3	73.3	74.5
73.0	58.8					

-----Percent of gross income-----

Other farm-related payments:

Northeast		1.4	0.3	0.9	4.9	3.1
9.0	14.0					
North Central		1.1	0.3	1.0	4.5	1.9
5.0	13.1					
South		0.8	0.2	0.7	1.5	3.2
5.9	11.4					
West		0.3	0.2	0.4	0.5	1.7
1.0	11.6					
U. S.		0.8	0.2	0.7	2.4	2.6
5.5	12.3					

1/ Includes livestock and crop sales, government payments, and other farm-related income.

2/ Includes livestock, dairy, and poultry sales.

3/ Includes only "nursery plants"; excludes cut flowers/greens, potted foliage/flowering plants, bedding and plants, and seeds.

4/ Includes only direct government payments.

5/ Includes customwork, gross cash rent, forest products, and other farm-related income.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 5a--Nursery crop farms reporting principal occupation is farming, by sales classes, and
by region and State, 1987

Region \$10,000- and State \$24,999		Less than \$10,000	-----Total value of agricultural sales-----				
			All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
			----- Number -----				
Northeast:			1,307	119	287	159	184
235		323					
	Connecticut		106	17	20	14	14
23		18					
	Maine		45	3	5	8	4
11		14					
	Massachusetts		116	9	26	11	22
16		32					
	New Hampshire		26	3	4	4	4
5		6					
	New Jersey		312	30	80	33	42
55		72					
	New York		282	27	68	35	43
40		69					
	Pennsylvania		360	23	72	47	51
73		94					
	Rhode Island		27	7	6	3	0
4		7					
	Vermont		33	2	4	4	4
8		11					
North Central:			1,218	113	271	170	171
216		277					
	Illinois		156	25	42	21	20
29		19					
	Indiana		100	6	27	9	18
15		25					
	Iowa		48	4	10	6	8
10		10					
	Kansas		41	4	11	6	6
5		9					
	Michigan		279	19	69	46	43
42		60					
	Minnesota		75	7	14	9	11
13		21					
	Missouri		68	8	14	8	6
15		17					
	Nebraska		25	1	8	2	3
3		8					

	North Dakota	14	1	3	5	1
1	3					
	Ohio	280	28	48	43	37
50	74					
	South Dakota	11	1	1	2	2
2	3					
	Wisconsin	121	9	24	13	16
31	28					
	South:	2,967	275	699	394	408
508	683					
	Alabama	101	13	28	12	7
17	24					
	Arkansas	47	2	8	8	4
9	16					
	Delaware	17	3	3	1	3
3	4					
	Florida	1,009	103	276	154	119
160	197					
	Georgia	131	8	38	18	16
26	25					
	Kentucky	65	6	16	7	12
14	10					
	Louisiana	134	4	26	20	25
21	38					
	Maryland	105	14	24	14	12
18	23					
	Mississippi	46	3	12	7	4
12	8					
	North Carolina	392	17	73	42	70
83	107					
	Oklahoma	47	7	14	5	7
7	7					
	South Carolina	105	11	26	15	13
20	20					
	Tennessee	307	32	58	37	44
49	87					
	Texas	277	30	65	34	37
43	68					
	Virginia	156	21	30	16	31
19	39					
	West Virginia	28	1	2	4	4
7	10					
	West:	1,702	246	460	201	192
259	344					
	Alaska	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	Arizona	64	16	24	3	4
6	11					
	California	675	153	204	74	66
91	87					
	Colorado	58	1	25	6	5
10	11					

	Hawai i	118	3	18	21	15
17	44					
	Idaho	40	1	9	9	5
4	12					
	Montana	20	1	2	3	4
4	6					
	Nevada	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	New Mexico	30	1	7	4	5
4	9					
	Oregon	468	51	130	59	50
80	98					
	Utah	25	2	3	3	3
8	6					
	Washington	192	17	36	17	32
32	58					
	Wyomi ng	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
United States		7, 194	753	1, 717	924	955
1, 218	1, 627					

Appendix table 5b--Nursery crop farms reporting principal occupation is farming, by sales classes, and by

region and State, 1987

Region \$10,000- and State \$24,999		Less than \$10,000	-----Total value of agricultural				
			All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
			-----Percent of all				
farms-----							
Northeast:			44.6	4.1	9.8	5.4	6.3
8.0	11.0						
	Connecticut		55.2	8.9	10.3	7.3	7.3
12.0	9.4						
	Maine		53.6	3.6	5.9	9.5	4.8
13.1	16.7						
	Massachusetts		47.5	3.7	10.6	4.5	9.0
6.6	13.1						
	New Hampshire		44.1	5.1	6.7	6.8	6.8
8.5	10.2						
	New Jersey		41.1	4.0	10.6	4.3	5.5
7.2	9.5						
	New York		47.6	4.6	11.5	5.9	7.3
6.7	11.6						
	Pennsylvania		40.0	2.6	8.0	5.2	5.7
8.1	10.4						
	Rhode Island		69.2	17.9	15.4	7.7	0.0
10.3	17.9						
	Vermont		54.1	3.3	6.5	6.6	6.6
13.1	18.0						
	North Central:		41.6	3.9	9.2	5.8	5.8
7.4	9.5						
	Illinois		43.0	6.9	11.6	5.8	5.5
8.0	5.2						
	Indiana		38.6	2.3	10.4	3.5	6.9
5.8	9.7						
	Iowa		39.0	3.3	8.1	4.9	6.5
8.1	8.1						
	Kansas		46.6	4.5	12.6	6.8	6.8
5.7	10.2						
	Michigan		42.1	2.9	10.4	6.9	6.5
6.3	9.1						
	Minnesota		35.7	3.3	6.7	4.3	5.2
6.2	10.0						
	Missouri		38.2	4.5	7.8	4.5	3.4
8.4	9.6						
	Nebraska		31.6	1.3	10.1	2.5	3.8
3.8	10.1						

	North Dakota	51.9	3.7	11.2	18.5	3.7
3.7	11.1					
	Ohio	44.3	4.4	7.6	6.8	5.9
7.9	11.7					
	South Dakota	32.4	2.9	3.0	5.9	5.9
5.9	8.8					
	Wisconsin	44.5	3.3	8.8	4.8	5.9
11.4	10.3					
	South:	46.8	4.3	11.1	6.2	6.4
8.0	10.8					
	Alabama	45.5	5.9	12.5	5.4	3.2
7.7	10.8					
	Arkansas	56.6	2.4	9.7	9.6	4.8
10.8	19.3					
	Delaware	48.6	8.6	8.5	2.9	8.6
8.6	11.4					
	Florida	51.4	5.2	14.2	7.8	6.1
8.1	10.0					
	Georgia	44.9	2.7	13.0	6.2	5.5
8.9	8.6					
	Kentucky	40.9	3.8	10.1	4.4	7.5
8.8	6.3					
	Louisiana	51.7	1.5	10.0	7.7	9.7
8.1	14.7					
	Maryland	41.5	5.5	9.6	5.5	4.7
7.1	9.1					
	Mississippi	46.5	3.0	12.2	7.1	4.0
12.1	8.1					
	North Carolina	42.5	1.8	7.9	4.6	7.6
9.0	11.6					
	Oklahoma	45.6	6.8	13.5	4.9	6.8
6.8	6.8					
	South Carolina	49.8	5.2	12.3	7.1	6.2
9.5	9.5					
	Tennessee	46.3	4.8	8.8	5.6	6.6
7.4	13.1					
	Texas	42.7	4.6	10.1	5.2	5.7
6.6	10.5					
	Virginia	44.1	5.9	8.5	4.5	8.8
5.4	11.0					
	West Virginia	39.4	1.4	2.8	5.6	5.6
9.9	14.1					
	West:	54.0	7.8	14.6	6.4	6.1
8.2	10.9					
	Alaska	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	Arizona	55.7	13.9	20.9	2.6	3.5
5.2	9.6					
	California	59.4	13.5	17.9	6.5	5.8
8.0	7.7					
	Colorado	44.3	0.8	19.1	4.6	3.8
7.6	8.4					

	Hawai i	60. 2	1. 5	9. 2	10. 7	7. 7
8. 7	22. 4					
	Idaho	41. 2	1. 0	9. 2	9. 3	5. 2
4. 1	12. 4					
	Montana	45. 5	2. 3	4. 6	6. 8	9. 1
9. 1	13. 6					
	Nevada	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	New Mexico	44. 8	1. 5	10. 4	6. 0	7. 5
6. 0	13. 4					
	Oregon	52. 6	5. 7	14. 7	6. 6	5. 6
9. 0	11. 0					
	Utah	41. 0	3. 3	5. 0	4. 9	4. 9
13. 1	9. 8					
	Washington	50. 7	4. 5	9. 6	4. 5	8. 4
8. 4	15. 3					
	Wyomi ng	N/A	N/A	N/A	N/A	N/A
N/A	N/A					
	United States	46. 9	4. 9	11. 3	6. 0	6. 2
7. 9	10. 6					

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 6--U. S. nursery crop farms: Number, area in production, sales, and net cash farm income, 1987

Net cash farm income		Floriculture/env.			Nursery plant		Sales	
		horticulture area			area			
Region and State	Farms	Under cover	In the open	Under cover	In the open	Floriculture/ horticulture	Nursery crop	
Total	Per farm							
\$1,000	Dollars	Number	Square feet	Acres	Square feet	Acres	\$1,000	\$1,000
Northeast:		2,931	26,126,446	53,486	20,598,618	52,249	314,215	279,987
119,523	40,779							
Connecticut		192	10,242,519	7,242	9,944,074	7,171	57,458	55,755
16,367	85,245							
Maine		84	189,799	509	80,507	500	3,742	3,044
2,143	25,512							
Massachusetts		244	1,216,152	2,648	518,082	2,502	29,646	24,317
13,756	56,377							
New Hampshire		59	137,516	696	19,497	335	3,720	2,043
1,504	25,492							
New Jersey		759	6,513,413	13,581	5,001,908	13,463	73,036	64,241
35,649	46,968							
New York		593	2,249,170	10,877	1,236,833	10,770	57,320	52,455
19,914	33,582							
Pennsylvania		900	5,043,140	15,916	3,411,109	15,505	76,673	66,132
26,943	29,937							
Rhode Island		39	371,414	1,629	330,094	1,621	N. A.	10,388
N. A.	N. A.							
Vermont		61	163,323	389	56,514	382	2,118	1,613
837	13,721							
North Central:		2,927	19,172,337	69,175	13,006,559	63,330	339,255	296,789
108,969	37,229							
Illinois		363	1,581,353	14,487	760,225	13,584	63,587	59,147
22,592	62,237							
Indiana		259	684,842	4,456	193,790	4,276	18,936	16,441
7,621	29,425							
Iowa		123	697,783	3,290	308,350	3,159	15,334	13,599
4,771	38,789							
Kansas		88	422,277	2,427	67,704	1,410	6,922	3,864
890	10,114							
Michigan		662	8,074,835	13,257	7,104,974	12,176	85,619	75,248
21,610	32,644							
Minnesota		210	1,124,478	3,063	344,850	3,035	19,664	15,368
8,102	38,581							
Missouri		178	951,150	4,277	196,462	4,028	22,545	19,134
9,449	53,084							
Nebraska		79	109,740	1,405	11,580	1,280	3,756	3,199
1,780	22,532							
North Dakota		27	84,251	337	7,233	332	N. A.	1,456
N. A.								

Ohio	632	4,564,050	15,692	3,685,242	14,161	74,278	66,196
21,645	34,248						
South Dakota	34	188,185	676	12,275	647	2,343	1,602
1,016	29,882						
Wisconsin	272	689,393	5,808	313,844	5,243	24,464	21,535
8,588	31,574						
South:	6,340	63,277,221	105,724	44,148,326	98,271	766,005	674,680
292,944	46,206						
Alabama	222	5,513,858	5,537	4,773,919	5,054	61,011	52,396
26,184	117,946						
Arkansas	83	680,162	598	478,412	547	4,132	3,300
1,952	23,518						
Delaware	35	125,972	774	114,272	765	4,568	4,451
1,804	51,543						
Florida	1,964	25,740,382	21,366	16,822,250	18,871	257,059	226,965
121,759	61,995						
Georgia	292	2,173,500	6,094	1,982,258	3,508	46,775	40,913
15,589	53,387						
Kentucky	159	658,501	3,264	370,915	3,069	12,852	11,692
4,135	26,006						
Louisiana	259	1,664,982	4,840	1,181,820	4,784	17,559	15,818
4,822	18,618						
Maryland	253	1,340,403	6,697	527,722	6,170	33,187	27,049
6,059	23,949						
Mississippi	99	923,858	616	606,021	582	6,129	5,330
2,963	29,929						
North Carolina	923	4,266,012	8,217	2,447,885	8,132	52,943	44,949
22,663	24,554						
Oklahoma	103	2,647,948	3,670	2,271,613	3,132	37,285	34,461
6,508	63,184						
South Carolina	211	2,032,991	3,236	1,078,171	3,169	29,701	24,526
9,086	43,062						
Tennessee	663	2,982,341	22,322	2,447,042	22,160	66,857	63,454
23,090	34,827						
Texas	649	8,824,612	10,188	6,286,371	10,046	88,538	76,100
31,959	49,243						
Virginia	354	3,324,793	7,896	2,498,305	7,876	44,111	40,394
13,608	38,441						
West Virginia	71	376,906	410	261,350	409	3,297	2,882
732	10,310						
West:	3,154	46,064,061	49,622	33,093,402	46,806	842,773	739,553
306,510	97,181						
Alaska	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
N. A.	N. A.						
Arizona	115	862,431	2,138	440,831	2,125	33,759	32,838
13,857	120,496						
California	1,137	30,143,824	21,879	20,602,881	20,142	580,484	497,126
219,730	193,254						
Colorado	131	634,398	1,535	372,548	1,426	15,385	13,663
3,436	26,229						
Hawaii	196	2,506,098	464	1,598,034	392	10,361	7,056
3,445	17,577						

Idaho	97	72,814	1,760	20,000	1,561	4,537	4,119
3,207	33,062						
Montana	44	99,511	337	26,967	327	2,293	1,951
72	1,636						
Nevada	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
N. A.	N. A.	New Mexico	67	1,164,852	829	1,052,045	829
6,593	6,064	1,552	23,164				
Oregon	889	8,181,434	16,205	7,405,011	16,021	145,077	138,396
48,383	54,424						
Utah	61	611,930	496	199,550	266	6,770	3,679
1,814	29,738						
Washington	379	1,620,841	3,758	1,336,487	3,502	35,855	33,690
10,213	26,947						
Wyoming	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
N. A.	N. A.						
United States	15,352	154,640,065	278,007	110,846,905	260,656	2,262,248	1,991,009
827,946	53,931						

N. A. = Not available.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 7--Northeast region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,

1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- \$24,999	Less than \$10,000					
Farms and land in farms:						
Farms	Number	2,931	133	353	232	321
612	1,280					
Total land in farms	Acres	210,797	57,416	53,496	18,476	17,187
22,810	41,412					
Floriculture/env. hort. area:						
Under cover	Sq. ft.	26,126,446	17,544,583	4,849,276	1,403,747	1,186,687
758,207	383,946					
In the open	Acres	53,486	26,463	13,167	3,766	2,960
3,522	3,609					
Nursery plant area:						
Under cover	Sq. ft.	20,598,618	15,556,343	2,828,550	847,055	642,316
445,341	279,013					
In the open	Acres	52,249	25,685	12,906	3,723	2,925
3,464	3,546					
Type of organization:						
Individual or family	Farms	2,102	22	167	136	221
468	1,088					
Partnership	Farms	260	13	44	27	33
55	88					
Corporate:						
Family-held	Farms	493	85	122	60	58
77	91					
Other than family-held	Farms	56	12	15	6	6
10	7					
Other	Farms	20	1	5	3	3
2	6					
Gross cash farm income 2/	\$1,000	350,132	226,142	76,585	16,752	11,995
11,070	7,584					
Livestock sales	\$1,000	3,134	356	298	282	634
443	1,120					
Crop sales	\$1,000	341,851	224,908	75,326	15,664	10,963
9,606	5,384					
Floriculture/env. hort	\$1,000	314,215	206,698	68,752	14,531	10,202
9,009	5,025					
Nursery plant sales	\$1,000	279,987	187,852	58,458	12,334	8,504
8,106	4,733					
Government payments	\$1,000	394	87	193	41	29
23	21					
Other farm-related income	\$1,000	4,753	791	768	765	369
998	1,059					

Total cash farm expenses	\$1, 000	230, 609	154, 109	46, 501	10, 125	6, 739
6, 819	6, 315					
Variable expenses	\$1, 000	210, 105	145, 314	42, 076	8, 588	5, 235
4, 910	3, 982					
Seeds, bulbs, and other	\$1, 000	22, 389	15, 453	4, 691	1, 125	477
424	219					
Commercial fertilizer	\$1, 000	5, 749	3, 327	1, 284	458	210
256	214					
Agricultural chemicals	\$1, 000	6, 383	3, 578	1, 709	459	179
275	182					
Petroleum products	\$1, 000	10, 360	5, 492	2, 614	653	560
522	519					
Electricity	\$1, 000	3, 403	1, 748	811	340	190
164	149					
Hired farm labor	\$1, 000	91, 529	67, 655	19, 416	2, 432	1, 004
766	255					
Contract labor	\$1, 000	9, 655	6, 937	1, 609	487	122
371	129					
Repair and maintenance	\$1, 000	12, 713	6, 612	2, 803	828	900
868	702					
Custom work	\$1, 000	2, 068	1, 398	371	93	53
63	90					
Other expenses	\$1, 000	45, 856	33, 114	6, 768	1, 713	1, 540
1, 201	1, 523					
Fixed expenses	\$1, 000	20, 504	8, 795	4, 425	1, 537	1, 504
1, 909	2, 333					
Interest expense	\$1, 000	10, 713	5, 058	2, 350	779	788
933	804					
Cash rent	\$1, 000	3, 021	1, 937	773	120	75
69	47					
Property taxes	\$1, 000	6, 770	1, 800	1, 302	638	641
907	1, 482					
Net cash farm income 3/	\$1, 000	119, 523	72, 033	30, 084	6, 627	5, 256
4, 251	1, 269					
Average per farm	Dollars	40, 779	541, 602	85, 224	28, 565	16, 374
6, 946	991					
Capital assets:						
Value of land/buildings	\$1, 000	1, 032, 986	344, 263	186, 356	74, 731	96, 813
140, 966	189, 857					
Average per acre	Dollars	4, 900	5, 996	3, 484	3, 081	5, 096
8, 105	4, 694					
Average per farm	Dollars	361, 184	2, 588, 444	527, 921	285, 233	310, 298
236, 918	154, 355					
Value of machinery/equip.	\$1, 000	128, 747	35, 921	32, 074	11, 587	13, 714
15, 691	19, 760					
Average per farm	Dollars	45, 017	270, 083	90, 861	44, 226	43, 956
26, 371	16, 065					

1/ Includes Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.

cash farm income includes livestock sales, crop sales, government payments, and other farm related-income.
3/ Gross cash farm
farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 8--North Central region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,
1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- Less than \$24,999						
\$10,000						
Farms and land in farms:						
Farms	Number	2,927	140	372	276	344
623		1,172				
Total land in farms	Acres	254,160	69,218	61,904	30,032	23,648
28,439		40,919				
Floriculture/env. hort. area:						
Under cover	Sq. ft.	19,172,337	11,948,828	4,221,195	1,235,547	814,253
642,479		310,035				
In the open	Acres	69,175	38,120	15,051	5,159	3,456
3,804		3,585				
Nursery plant area:						
Under cover	Sq. ft.	13,006,559	9,250,328	2,068,925	746,407	366,366
352,504		222,029				
In the open	Acres	63,330	33,758	14,040	4,940	3,384
3,686		3,523				
Type of organization:						
Individual or family	Farms	2,065	18	164	175	240
481		987				
Partnership	Farms	239	6	41	31	25
55		81				
Corporate:						
Family-held	Farms	533	102	145	62	67
72		85				
Other than family-held	Farms	68	13	16	5	10
11		13				
Other	Farms	22	1	6	3	2
4		6				
Gross cash farm income 2/	\$1,000	362,966	230,505	81,181	21,158	12,927
10,814		6,383				
Livestock sales	\$1,000	4,090	96	1,433	844	754
359		604				
Crop sales	\$1,000	353,600	229,779	78,253	19,064	11,858
9,823		4,824				
Floriculture/env. hort.	\$1,000	339,255	225,853	71,495	17,120	11,095
9,235		4,456				
Nursery plant sales	\$1,000	296,789	200,954	59,317	14,305	9,657
8,360		4,196				
Government payments	\$1,000	1,277	48	643	305	69
95		118				
Other farm-related income	\$1,000	3,999	582	852	945	246
537		837				

Total cash farm expenses	\$1,000	253,997	169,430	54,075	10,199	8,517
6,262	5,515					
Variable expenses	\$1,000	230,635	156,891	49,016	8,839	7,497
4,659	3,735					
Seeds, bulbs, and other	\$1,000	31,261	23,585	4,920	1,154	631
648	322					
Commercial fertilizer	\$1,000	5,546	3,055	1,542	377	178
246	147					
Agricultural chemicals	\$1,000	5,725	2,989	1,549	420	251
349	166					
Petroleum products	\$1,000	9,900	4,454	3,005	839	528
471	602					
Electricity	\$1,000	3,425	1,674	996	206	148
189	212					
Hired farm labor	\$1,000	98,038	70,980	21,517	2,621	1,384
961	576					
Contract labor	\$1,000	8,234	5,747	1,660	192	396
131	107					
Repair and maintenance	\$1,000	14,615	7,151	4,291	805	892
620	855					
Custom work	\$1,000	2,175	1,285	434	185	87
124	59					
Other expenses	\$1,000	51,716	35,971	9,102	2,040	3,002
920	689					
Fixed expenses	\$1,000	23,362	12,539	5,059	1,360	1,020
1,603	1,780					
Interest expense	\$1,000	13,693	8,082	2,726	711	417
974	782					
Cash rent	\$1,000	4,367	2,921	1,009	194	93
72	78					
Property taxes	\$1,000	5,302	1,536	1,324	455	510
557	920					
Net cash farm income 3/	\$1,000	108,969	61,075	27,106	10,959	4,410
4,552	868					
Average per farm	Dollars	37,229	436,250	72,866	39,707	12,820
7,307	741					
Capital assets:						
Value of land/buildings	\$1,000	602,208	199,655	134,530	43,503	48,677
59,504	116,339					
Average per acre	Dollars	2,460	2,884	2,173	1,340	2,405
2,137	3,223					
Average per farm	Dollars	222,628	1,426,107	361,640	169,934	146,177
106,829	113,060					
Value of machinery/equipment	\$1,000	123,382	34,603	32,464	12,226	14,175
15,584	14,330					
Average per farm	Dollars	45,613	247,161	87,269	47,759	42,568
<u>27,978</u>	<u>13,926</u>					

1/ Includes Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and

cash farm income includes livestock sales, crop sales, government payments, and other farm-related income.
3/ Gross cash farm
farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 9--Southern region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,

1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- \$24,999	Less than \$10,000					
Farms and land in farms:						
Farms	Number	6,340	342	935	621	761
1,263	2,418					
Total land in farms						
Acres		709,685	231,704	159,816	84,774	52,010
83,297	98,084					
Floriculture/env. hort. area:						
Under cover	Sq. ft.	63,277,221	31,513,749	18,182,430	4,369,821	3,486,932
3,349,377	2,374,912					
In the open	Acres	105,724	53,391	27,783	7,695	5,656
5,493	5,705					
Nursery plant area:						
Under cover	Sq. ft.	44,148,326	21,086,556	12,622,723	3,257,818	2,593,502
2,650,525	1,937,202					
In the open	Acres	98,271	48,075	26,513	7,343	5,431
5,335	5,574					
Type of organization:						
Individual or family	Farms	4,237	57	396	358	481
899	2,046					
Partnership	Farms	690	29	124	82	115
158	182					
Corporate:						
Family-held	Farms	1,159	209	348	153	139
173	137					
Other than family-held	Farms	191	45	64	24	22
20	16					
Other	Farms	63	2	3	4	4
13	37					
Gross cash farm income 2/						
\$1,000		910,701	593,001	199,711	47,117	30,097
24,337	16,438					
Livestock sales	\$1,000	24,539	9,711	1,568	3,415	2,794
2,756	4,294					
Crop sales	\$1,000	876,826	581,348	196,150	42,836	26,292
19,989	10,211					
Floriculture/env. hort.	\$1,000	766,005	485,372	187,067	40,313	24,898
18,835	9,520					
Nursery plant sales	\$1,000	674,680	422,962	167,417	36,180	22,121
17,227	8,773					
Government payments	\$1,000	1,664	591	625	165	58
163	62					
Other farm-related income	\$1,000	7,672	1,351	1,368	701	953
1,429	1,871					

Total cash farm expenses	\$1, 000	617, 757	422, 314	124, 354	25, 931	16, 308
15, 249	13, 601					
Variable expenses	\$1, 000	566, 274	394, 676	112, 877	22, 394	13, 715
12, 271	10, 341					
Seeds, bulbs, and other	\$1, 000	45, 508	30, 458	10, 787	1, 835	1, 018
879	531					
Commercial fertilizer	\$1, 000	22, 635	14, 731	4, 614	1, 054	738
813	686					
Agricultural chemicals	\$1, 000	25, 369	17, 574	4, 676	1, 169	609
750	591					
Petroleum products	\$1, 000	22, 133	11, 338	5, 956	1, 433	1, 190
1, 143	1, 074					
Electricity	\$1, 000	10, 745	5, 576	2, 892	740	590
456	492					
Hired farm labor	\$1, 000	220, 954	157, 168	47, 613	7, 773	4, 711
2, 327	1, 362					
Contract labor	\$1, 000	38, 500	27, 595	7, 454	1, 565	575
782	529					
Repair and maintenance	\$1, 000	33, 043	20, 023	7, 089	1, 995	1, 105
1, 437	1, 394					
Custom work	\$1, 000	10, 352	8, 158	1, 347	257	182
242	166					
Other expenses	\$1, 000	137, 035	102, 055	20, 449	4, 573	2, 997
3, 442	3, 516					
Fixed expenses	\$1, 000	51, 483	27, 638	11, 477	3, 537	2, 593
2, 978	3, 260					
Interest expense	\$1, 000	34, 353	18, 782	7, 873	2, 399	1, 709
1, 757	1, 832					
Cash rent	\$1, 000	6, 321	3, 884	1, 414	326	265
299	133					
Property taxes	\$1, 000	10, 809	4, 972	2, 190	812	619
922	1, 295					
Net cash farm income 3/	\$1, 000	292, 944	170, 687	75, 357	21, 186	13, 789
9, 088	2, 837					
Average per farm	Dollars	46, 206	499, 085	80, 596	34, 116	18, 120
7, 196	1, 173					
Capital assets:						
Value of land/buildings	\$1, 000	2, 468, 909	1, 331, 200	384, 414	184, 134	151, 257
179, 833	238, 071					
Average per acre	Dollars	3, 483	5, 745	2, 405	2, 220	2, 738
2, 109	2, 602					
Average per farm	Dollars	408, 084	3, 892, 398	411, 138	308, 432	200, 340
158, 583	106, 140					
Value of machinery/equipmen	\$1, 000	279, 581	96, 465	69, 528	26, 246	23, 447
27, 303	36, 593					
Average per farm	Dollars	46, 288	282, 063	74, 361	43, 964	31, 055
<u>24, 076</u>	<u>16, 343</u>					

1/ Includes Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia,

Florida, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, and Texas. 2/ Gross cash farm income includes livestock sales, government payments, and other farm-related income. 3/ Gross cash farm income less cash farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 10--Western region nursery crop farms: Number, land, organization, income, and expenses, by economic classes,

1987 1/

Item	Unit	All farms	\$500,000 or more	\$100,000- \$499,999	\$50,000- \$99,999	\$25,000- \$49,999
\$10,000- \$24,999	Less than \$10,000					
Farms and land in farms:						
Farms	Number	3,154	295	582	290	350
538	1,099					
Total land in farms	Acres	269,034	92,109	92,220	23,330	12,630
16,773	31,972					
Floriculture/env. hort. area:						
Under cover	Sq. ft.	46,064,061	31,455,881	9,786,993	1,561,375	1,227,430
1,156,665	875,717					
In the open	Acres	49,622	31,588	10,168	2,400	1,890
1,714	1,862					
Nursery plant area:						
Under cover	Sq. ft.	33,093,402	21,610,171	7,635,825	1,107,305	1,019,639
996,727	723,735					
In the open	Acres	46,806	29,827	9,440	2,282	1,850
1,588	1,818					
Type of organization:						
Individual or family	Farms	2,142	44	276	187	266
425	944					
Partnership	Farms	375	38	81	46	38
72	100					
Corporate:						
Family-held	Farms	500	164	184	48	37
28	39					
Other than family-held	Farms	111	48	37	5	6
8	7					
Other	Farms	26	1	4	4	3
5	9					
Gross cash farm income 2/						
\$1,000	\$1,000	918,754	735,168	132,954	21,895	12,603
9,987	6,095					
Livestock sales	\$1,000	7,135	137	2,984	1,471	230
1,399	914					
Crop sales	\$1,000	907,350	732,859	129,168	20,290	12,135
8,481	4,417					
Floriculture/env. hort.	\$1,000	842,773	686,133	115,729	18,118	10,957
7,792	4,043					
Nursery plant sales	\$1,000	739,553	598,835	103,856	15,648	10,103
7,335	3,775					
Government payments	\$1,000	1,122	648	363	21	29
4	57					
Other farm-related income	\$1,000	3,147	1,524	439	113	209
103	707					

Total cash farm expenses	\$1,000	612,244	493,297	87,484	11,931	8,613
4,873	6,045					
Variable expenses	\$1,000	559,896	454,504	79,836	10,413	6,911
3,975	4,253					
Seeds, bulbs, and other	\$1,000	51,989	42,837	7,314	951	506
176	206					
Commercial fertilizer	\$1,000	16,249	12,257	2,693	362	437
212	287					
Agricultural chemicals	\$1,000	19,361	15,518	2,513	376	340
286	328					
Petroleum products	\$1,000	19,935	13,811	4,165	713	469
279	497					
Electricity	\$1,000	11,634	8,855	1,761	387	218
158	254					
Hired farm labor	\$1,000	270,735	229,061	34,825	3,739	2,059
569	481					
Contract labor	\$1,000	25,270	19,024	4,754	358	459
426	249					
Repair and maintenance	\$1,000	26,458	19,428	4,510	890	688
384	559					
Custom work	\$1,000	5,402	4,096	847	191	101
62	105					
Other expenses	\$1,000	112,863	89,617	16,454	2,446	1,634
1,423	1,287					
Fixed expenses	\$1,000	52,348	38,793	7,648	1,518	1,702
898	1,792					
Interest expense	\$1,000	29,721	21,866	4,930	738	967
492	729					
Cash rent	\$1,000	12,842	10,479	1,447	448	229
66	174					
Property taxes	\$1,000	9,785	6,448	1,271	332	506
340	889					
Net cash farm income 3/	\$1,000	306,510	241,871	45,470	9,964	3,990
5,114	50					
Average per farm	Dollars	97,181	819,902	78,127	34,359	11,400
9,506	45					
Capital assets:						
Value of land/buildings	\$1,000	1,459,878	856,335	230,322	91,873	79,313
63,092	138,943					
Average per acre	Dollars	5,291	9,297	2,498	4,558	7,614
7,707	2,280					
Average per farm	Dollars	478,022	2,902,831	395,742	381,216	195,835
161,774	121,880					
Value of machinery/equipment	\$1,000	155,697	79,301	35,666	9,735	8,931
6,820	15,245					
Average per farm	Dollars	50,981	268,816	61,282	40,392	22,052
17,487	13,372					

1/ Includes Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon, California, Alaska, and

2/ Gross cash farm income includes livestock sales, crop sales, government payments, and other farm-related income. 3/ Gross income less cash farm expenses.

Sources: 1987 Census of Agriculture and Economic Research Service, USDA.

Appendix table 11a--Capital Requirements for Two Sizes of Field Nurseries, Climatic Zones 7 and 8, 1984 1/2/

Item	Nursery Size			
	Small (50 ac)		Large (100 ac)	
	Cost	Percent of total	Cost	Percent of total
	\$1, 000	%	\$1, 000	%
Land/ w gravel roads	126	36	239	47
Buildings, inc. grnh	76	22	84	16
Machinery, equip.	147	42	191	37
Total	349	100	514	100

Appendix table 11b--Annual Fixed Costs for Two Sizes of Field Nurseries, Climatic Zones 7 and 8, 1984

Nursery Size	Total	Per acre of growing area 3/
--- (Dollars)---		
Small (50 acres)	133, 005	3, 325
Large (100 acres)	177, 991	2, 094

Appendix table 11c--Total Costs per Saleable Plant Based on One Acre of Production for Two Sizes of Field Nurseries by Size

Climatic Zones 7 and 8, 1984			
Plant Specie & Size	Nursery Size		
	Small (50 ac)	Large (100 ac)	
--- (Dollars)---			
Euonymus 18-24"	3.59	3.10	
Juni perus 18-24"	4.29	3.70	
Red Maple 1.5-1.75"	8.29	6.86	
Dogwood 4-5'	7.35	6.09	

1/ Nearly all of Georgia is in climatic zones 7 and 8.

2/ Information in table 1, 2, and 3 are derived from "Investment and Operating Costs for Field Nurseries," Climatic Zones 7 and 8. T. D. Phillips, and M. B. Badenhop, 1985. Proceedings SNA Research Conference.

3/ Based on actual production area of 40 acres for small and 85 acres for large nursery.

Source: "Field Nursery Stock Production in Georgia", Cooperative Extension University of Georgia, Bulletin 995, August 1988.

Appendix table 12--Cash Flow Model for Establishing 70 Acre Shade Tree Nursery

(10 acres set each year in a seven-year rotation, unadjusted for income taxes)

Year Numbers	1	2	3	4	5	6
7	8					
	Dollars					
Variable Costs:						
Manager 15,000 15,000	15,000	15,000	15,000	15,000	15,000	15,000
Labor 10,000 10,000	5,000	5,000	10,000	10,000	10,000	10,000
Fertilizer, lime 150 150	150	150	150	150	150	150
Machine operation 840 840	120	240	360	480	600	720
Spraying 2,400 2,400	400	800	1,200	1,600	2,000	2,400
Miscellaneous 3,000 3,000	500	1,000	1,500	2,000	2,500	3,000
Building depreciatio 624 624	624	624	624	624	624	624
Plant materials 18,500 18,500	18,500	18,500	18,500	18,500	18,500	18,500
Total current expens 50,164 50,164	39,944	40,964	46,984	48,004	49,024	50,044
Interest on operating capital 4% (1/2 year) 2,007 2,007	1,598	1,639	1,879	1,920	1,961	2,002
Annual Variable Cost 52,171 52,171	41,542	42,603	48,863	49,924	50,985	52,046
Annual interest (8%) on net operating expense previous year 8,334 889		3,333	6,997	11,466	15,200	15,045
Sales (standing trees) 175,914 175,914				14,723	68,117	150,852
Net unrecovered cost 11,107 135,739	(41,542)	(87,468)	(143,328)	(189,995)	(188,063)	(104,302)
Fixed Costs:						
Land \$40/acre 2,800 2,800	400	800	1,200	1,600	2,000	2,400
Machinery 1,500 1,500	1,500	1,500	1,500	1,500	1,500	1,500
Old buildings 2,344 2,344	2,344	2,344	2,344	2,344	2,344	2,344
Total fixed costs 6,644 6,644	4,244	4,644	5,044	5,444	5,844	6,244

Annual interest (8%) on						
unrecovered fixed costs		340	738	1,201	1,732	2,338
3,025	3,799					
Unrecovered fixed						
costs accumulated	4,244	9,228	15,010	21,655	29,231	37,813
47,482	57,925					
Net Total						
Costs Accumulated	(45,786)	(96,696)	(158,338)	(211,650)	(217,294)	(142,115)
(36,375)	77,814					

Source: P. L. Smeal, J. S. Coartney, and K. E. Loope. "The Economics of Establishing a Shade Tree Nursery," , Virginia Polytechnic Institute. 1974.

Appendix table 13

Scientific Name Index for Field-Grown Nursery Crops

Scientific Name Index for Field-Grown Nursery Crops

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Abelia grandiflora</i>	Glossy Abelia	Broadleaf evergreen shrub	6
<i>Abelia chinensis</i>		Broadleaf evergreen shrub	6
<i>Abelia uniflora</i>		Broadleaf evergreen shrub	6
<i>Abies concolor</i>	White or Concolor Fir	Coniferous evergreen tree	2
<i>Acer barbatum</i>	Florida Maple	Deciduous tree	9
<i>Acer buergerianum</i>	Trident Maple	Deciduous tree	5
<i>Acer campestre</i>	Hedge Maple	Deciduous tree	4
<i>Acer cappadocicum</i>	Coliseum Maple	Deciduous tree	6
<i>Acer dasycarpum</i>	Silver, Soft, or River Maple	Deciduous tree	4
<i>Acer floridanum</i>	Florida Maple	Deciduous tree	9
<i>Acer ginnala</i>	Amur Maple	Deciduous tree	2
<i>Acer giseum</i>	Paperbark Maple	Deciduous tree	5
<i>Acer grandidentatum</i>	Bigtooth Maple	Deciduous tree	6
<i>Acer miyabei</i>	Miyabe Maple	Deciduous tree	4 or 5
<i>Acer negundo</i>	Boxelder	Deciduous tree	2
<i>Acer palmatum</i>	Japanese Maple	Deciduous tree	5
<i>Acer platanoides</i>	Norway Maple	Deciduous tree	3
<i>Acer rubrum</i>	Red or Swamp Maple	Deciduous tree	3
<i>Acer saccharinum</i>	Silver, Soft, or River Maple	Deciduous tree	4
<i>Acer saccharum</i>	Sugar, Hard, or Rock Maple	Deciduous tree	3
<i>Aegopodium podogaria</i>	Goutweed or Bishop's Weed	Groundcover	4
<i>Aesculus arguta</i>	Texas Buckeye	Deciduous tree	5
<i>Aesculus glabra</i>	Ohio Buckeye	Deciduous tree	4
<i>Aesculus hippocastanum</i>	Horsechestnut	Deciduous tree	4
<i>Aesculus parviflora</i>	Bottlebrush Buckeye	Deciduous shrub	5
<i>Aesculus pavia</i>	Red Buckeye	Deciduous shrub	5
<i>Agave spp</i>	Agave	Broadleaf evergreen shrub	6
<i>Ailanthus altissima</i>	Tree-of-Heaven	Broadleaf evergreen shrub	4
<i>Ajuga reptans</i>	Carpetbugle, Ajuga, or Bugleweed	Groundcover	6
<i>Albizia julibrissin</i>	Mimosa or Silktree	Groundcover	6
<i>Alnus glutinosa</i>	Black Alder	Groundcover	3
<i>Alyssum saxatile</i>	Golden Alyssum or Basket-of-Gold	Groundcover	5
<i>Amelanchier arborea</i>	Downy Serviceberry	Deciduous tree	3
<i>Amelanchier grandiflora</i>	Apple serviceberry	Deciduous tree	3
<i>Amelanchier laevis</i>	Allegheny Serviceberry	Deciduous tree	3
<i>Aralia japonica</i>	Japanese Fatsia	Broadleaf evergreen shrub	8
<i>Araucaria bidwilli</i>	Monkey Puzzle tree	Narrowleaf evergreen shrub	7b-9
<i>Arecastrum spp</i>	Queen Palm	Broadleaf evergreen shrub	8b

<i>Arundinaria pigmaea</i>	Dwarf Bamboo	Broadleaf evergreen shrub	7
<i>Arundinaria variegata</i>	Dwarf white striped bamboo	Broadleaf evergreen shrub	6
<i>Aspidistra elatior</i>	Cast Iron Plant	Herbaceous perennial	8
<i>Aucuba japonica</i>	Japanese Aucuba or Gold Dust Plant	Broadleaf evergreen shrub	7
<i>Surinia saxatilis</i>	Golden Alyssum	Groundcover	5
<i>Azalea obtusum</i>	Kurume Azalea	Broadleaf evergreen shrub	6
<i>Bambusa spp</i>	Bamboo	Broadleaf evergreen shrub	6-7
<i>Bambusa multiplex</i>	Hedge Bamboo	Broadleaf evergreen shrub	6
<i>Berberis aquifolium</i>	Holly Grape	Broadleaf evergreen shrub	5
<i>Berberis julianae</i>	Wintergreen Barberry	Broadleaf evergreen shrub	6
<i>Berberis X gladwynensis</i>	William Penn Barberry	Broadleaf evergreen shrub	6
<i>Berberis mentorensis</i>	Mentor Barberry	Deciduous tree	3
<i>Berberis thunbergi</i>	Japanese Barberry	Deciduous tree	3
<i>Berberis verrucolosa</i>		Broadleaf evergreen shrub	6
<i>Betula alba</i>	European Birch	Deciduous tree	2
<i>Betula nigra</i>	River Birch	Deciduous tree	2
<i>Betula papyrifera</i>	Canoe or Paper Birch	Deciduous tree	2
<i>Betula pendula</i>	European Birch	Deciduous tree	2
<i>Betula verrucosa</i>	European Birch	Deciduous tree	2
<i>Broussonetia papyrifera</i>	Paper Mulberry	Deciduous tree	5
<i>Bumelia lanuginosa</i>	Chittinwood	Deciduous tree	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Butia capitata</i>	Pindo or Jelly Palm	Broadleaf evergreen shrub	8b
<i>Buxus harlandi</i>	Korean Box	Broadleaf evergreen shrub	5
<i>Buxus microphylla</i>	Japanese or Littleleaf Boxwood	Broadleaf evergreen shrub	5
<i>Buxus sempervirens</i>	English or Common Boxwood	Broadleaf evergreen shrub	5
<i>Callistemon citrinus</i>	Citrus-leaved Bottlebrush	Broadleaf evergreen shrub	9b-10
<i>Calocedrus decurrens</i>	California Incense Cedar	Coniferous evergreen tree	5
<i>Calycanthus floridus</i>	Sweetshrub	Deciduous shrub	5
<i>Camellia japonica</i>	Japanese Camellia	Broadleaf evergreen shrub	7b
<i>Camellia sasanqua</i>	Sasanqua Camellia	Broadleaf evergreen shrub	7
<i>Campsis grandiflora</i>	Chinese Trumpet Creeper	Deciduous vine	7
<i>Campsis radicans</i>	Trumpet Creeper	Deciduous vine	5
<i>Carpinus betulus</i>	European Hornbeam	Deciduous tree	4
<i>Carpinus caroliniana</i>	American Hornbeam or Blue Beech	Deciduous tree	3
<i>Caragana arborescens</i>	Siberian Pea Shrub	Deciduous shrub	2
<i>Caragana frutex</i>	Tussian Pean Shrub	Deciduous shrub	2
<i>Carya</i> spp.	Hickories	Deciduous tree	3-6
<i>Carya cordiformis</i>	Bitternut Hickory	Deciduous tree	4
<i>Carya illinoensis</i>	Pecan	Deciduous tree	5
<i>Carya ovata</i>	Shagbark Hickory	Deciduous tree	3-6
<i>Castanea dentata</i>	American Chestnut	Deciduous tree	4
<i>Castanea mollissima</i>	Chinese Chestnut	Deciduous tree	4
<i>Catalpa bignonioides</i>	Southern Catalpa	Deciduous tree	6
<i>Catalpa speciosa</i>	Northern Catalpa	Deciduous tree	6
<i>Cedrus atlantica</i>	Atlas Cedar	Coniferous evergreen tree	6
<i>Cedrus deodora</i>	Deodar Cedar	Coniferous evergreen tree	7
<i>Cedrus libani</i>	Cedar of Lebanon	Coniferous evergreen tree	6
<i>Celastrus orbiculatus</i>	Oriental Bittersweet	Deciduous shrub	5
<i>Celastrus scandens</i>	Amerbittersweet	Deciduous shrub	4
<i>Celtis occidentalis</i>	Hackberry	Deciduous tree	5
<i>Cephalotaxus harringtonia</i>	"Fastigiata"	Upright Plum Yew	narrowleaf evergreen shrub
<i>Cercidiphyllum japonicum</i>	Katsuratree	Deciduous tree	5
<i>Cercis canadensis</i>	Eastern Redbud	Deciduous tree	4
<i>Cercis chinensis</i>	Chinese Redbud	Deciduous tree	4
<i>Chaenomeles japonica</i>	Japanese Flowering Quince	Deciduous shrub	4

<i>Chaenomeles lagenaria</i>	Flowering Quince	Deciduous shrub	4
<i>Chaenomeles speciosa</i>	Flowering Quince	Deciduous shrub	4
<i>Chaenomeles X 'suberba'</i>		Deciduous shrub	4
<i>Chamaecyparis lawsoniana</i>	Lawson False Cypress 6	Coniferous evergreen tree	tree
<i>Chamaecyparis nootkatensis</i>	Nootka or Alaska Cypress 4	Coniferous evergreen tree	tree
<i>Chamaecyparis obtusa</i>	Hinoki False Cypress 5	Coniferous evergreen tree	tree
<i>Chamaecyparis pisifera</i>	Japanese False Cypress 5	Coniferous evergreen tree	tree
<i>Chamaerops humilis</i>	European Fan Palm	Broadleaf evergreen shrub	8
<i>Chilopsis linearis</i>	Desertwillow	Deciduous tree	7
<i>Cinnamum camphora</i>	Chinese Fringetree	Deciduous tree	6
<i>Cionanthus retusus</i>	Chinese Fringetree	Deciduous tree	6
<i>Cinnamomum camphora</i>	Camphor tree	Broadleaf evergreen shrub	9
<i>Cladrastis lutea</i>	American Yellowwood	Deciduous tree	
<i>Clematis</i> spp.	<i>Clematis</i>	Deciduous vine	4
<i>Clematis X "Jackmani"</i>	Jackman Clematis	Deciduous vine	4
<i>Clematis paniculata</i>	Sweetautumn Clematis	Deciduous vine	4
<i>Clematis virginiana</i>	Woodbine or Virginsbower	Deciduous vine	4
<i>Cleyera japonica</i>	<i>Cleyera</i>	Broadleaf evergreen shrub	7
<i>Cocos australis</i>	Pindo or Jelly Palm	Broadleaf evergreen shrub	86
<i>Cocos nucifera</i>	Coconut	Broadleaf evergreen shrub	8
<i>Codiaeum variegatum</i>	Croton	Broadleaf evergreen shrub	8
<i>Cornus alba</i>		Deciduous shrub	2
<i>Cornus drummondii</i>	Roughleaf Dogwood	Deciduous tree	2

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Cornus florida</i>	Flowering Dogwood	Deciduous tree	4-5
<i>Cornus kousa</i>	Kousa Dogwood	Deciduous tree	5
<i>Cornus mas</i>	Corneliancherry Dogwood	Deciduous tree	5
<i>Cornus sericea</i>	Red-osier Dogwood	Deciduous shrub	2
<i>Cornus stolonifera</i>	Red-osier Dogwood	Deciduous shrub	2
<i>Cortaderia selloana</i>	Pampas Grass	Ornamental grass	7
<i>Cortinus coggygria</i>	Smoketree	Deciduous tree	3
<i>Cotoneaster</i> spp.	Cotoneaster	Deciduous shrub	4-7
<i>Cotoneaster dammeri</i>	Bearberry Cotoneaster	Deciduous shrub	6
<i>Cotoneaster divaricatus</i>	Spreading Cottoneaster	Deciduous shrub	5
<i>Cotoneaster horizontalis</i>	Rockspray Cottoneaster	Deciduous shrub	4
<i>Cotoneaster lucidus</i>	Hedge Cottoneaster	Deciduous shrub	5
<i>Cotoneaster multiflorus</i>	Many Flowered Cotoneaster	Deciduous shrub	3-6
<i>Crataegus</i> spp.	Hawthorn	Deciduous tree	3-6
<i>Crataegus crus-galli</i>	Cockspur Hawthorn	Deciduous tree	4
<i>Crataegus mollis</i>	Downy Hawthorn	Deciduous tree	4
<i>Crataegus X mordenensis</i>	Toba Hawthorn	Deciduous tree	4
<i>Crataegus oxyacantha</i>	Paul's Scarlet Hawthorn	Deciduous tree	4
<i>Crataegus phaenopyrum</i>	Washington Hawthorn	Deciduous tree	4
<i>Crataegus succulenta</i>		Deciduous tree	4
<i>Cryptomeria japonica</i>	Japanese Cryptomeria	Coniferous evergreen tree	6
<i>Cunninghamia lanceolata</i>	China Fir	Coniferous evergreen tree	7
<i>Cupressocyparis leylandi</i>	Leyland Cypress	Coniferous evergreen tree	6
<i>Cupressus arizonica</i>	Arizona Cypress	Coniferous evergreen tree	7
<i>Cupressus macrocarpa</i>	Monterey Cypress	Coniferous evergreen tree	6
<i>Cupressus sempervirens</i>	Italian Cypress	Coniferous evergreen tree	8
<i>Dasyliirion texanum</i>	Sotol or Bear Grass	Broadleaf evergreen shrub	8
<i>Deutzia gracilis</i>	Slender Deutzia	Deciduous shrub	5
<i>Deutzia X lemoinei</i>	Lemoinei Deutzia	Deciduous shrub	4
<i>Deutzia parviflora</i>		Deciduous shrub	4
<i>Diospyros kaki</i>	Oriental Persimon	Deciduous tree	7
<i>Diospyros virginiana</i>	Common Persimmon or Possumwood	Deciduous tree	4
<i>Elaeagnus Angustiflolia</i>	Russian Olive	Deciduous tree	2
<i>Elaeagnus macrophylla</i>	Silverberry	Broadleaf evergreen shrub	7

<i>Elaeagnus pungens</i>	Thorny Elaeagnus	Broadleaf evergreen shrub	7
<i>Erianthus ravennae</i>	Plume Grass	Ornamental grass	7
<i>Eriobotrya japonica</i>	Loquat	Broadleaf evergreen shrub	8
<i>Eucommia ulmoides</i>	Hardy Rubber tree	Deciduous tree	5
<i>Euonymus alata</i>	Winged Euonymus or Burning Bush	Deciduous tree	3
<i>Euonymus bungeana</i>	Wintervberry Euonymus	Deciduous tree	4
<i>Euonymus europaea</i>	European Spindle Tree	Deciduous tree	4
<i>Euonymus fortunei</i>	Evergreen Wintercreeper	Groundcover/vine/shrub	4
<i>Euonymus japonica</i>	Evergreen Euonymus	Broadleaf evergreen shrub	7
<i>Euonymus kiauutschovica</i>	Spreading Euonymus	Broadleaf evergreen shrub	6
<i>Euonymus patens</i>	Spreading Euonymum	Broadleaf evergreen shrub	6
<i>Euonymus radicans</i>	Evergreen Wintercreeper	Broadleaf evergreen shrub/vine groundcover	4
<i>Exochorda geraldii</i>		Deciduous tree	5
<i>Exochorda racemosa</i>	Pearlbush	Deciduous tree	5
<i>Fagus grandiflora</i>	American Beech	Deciduous tree	3
<i>Fagus sylvatica</i>	European Beech	Deciduous tree	3
<i>Fatshedera lizei</i>		Broadleaf evergreen shrub	8
<i>Fatsia japonica</i>	Japanese Fatsia	Broadleaf evergreen shrub	8
<i>Feijoa sellowiana</i>	Pineapple Guava or Feijoa	Broadleaf evergreen shrub	8
<i>Festuca ovina</i>	Sheep's or Blue Fescue	Ornamental grass	5
<i>Ficus caruca</i>	Common or Edible Fig	Deciduous tree	7b
<i>Ficus pumila</i>	Creeping Fig	Groundcover	8
<i>Forsythia spp.</i>	Forsythia or Goldenbell	Deciduous shrub	5
<i>Forsythia intermedia</i>		Deciduous shrub	5
<i>Forsythia japonica</i>		Deciduous shrub	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Forsythia suspensa</i>	Weeping Forsythia	Deciduous shrub	5
<i>Forsythia viridissima</i>		Deciduous shrub	5
<i>Franklinia alatamaha</i>	Franklin Tree	Deciduous tree	6
<i>Fraxinus americana</i>	White Ash	Deciduous tree	2
<i>Fraxinus excelsior</i>	European Ash	Deciduous tree	5
<i>Fraxinus pennsylvanica</i>	Green Ash	Deciduous tree	2
<i>Fraxinus quadrangulata</i>	Blue Ash	Deciduous tree	4
<i>Gardenia jasminoides</i>	Gardenia or Cape Jasmine	Broadleaf evergreen tree	8
<i>Gelsemium sempervirens</i>	Carolina Yellow Jessamine	Broadleaf evergreen vine	7
<i>Ginkgo biloba</i>	Ginkgo or Maidenhair Tree	Deciduous tree	4
<i>Gleditsia triacanthos</i>	Honeylocust	Deciduous tree	4
<i>Gordonia lasianthus</i>	Gordonia or Loblolly Bay	Broadleaf evergreen tree	7b
<i>Gymocladus dioica</i>	Kentucky Coffee Tree	Deciduous tree	4
<i>Halesia carolina</i>	Carolina Silverbell	Deciduous tree	5
<i>Halesia diptera</i>	Two-winged Silverbell	Deciduous tree	5
<i>Hamamelis vernalis</i>	Vernal Witchhazel	Deciduous tree	4
<i>Hedera canariensis</i>	Algerian Ivy	Groundcover/vine	8b-10
<i>Hedera helix</i>	English Ivy	Groundcover/vine	5
<i>Hesperaloe parviflora</i>	Red Yucca	Broadleaf evergreen shrub	7
<i>Hibiscus rosa-sinensis</i>	Chinese Hibiscus	Deciduous shrub	10
<i>Hibiscus syriacus</i>	Rose-of-Sharon or Shrub Althea	Deciduous shrub	5
<i>Hosta</i> spp.	Hosta or Plantain Lily	Herbaceous perennial	5-6
<i>Hosta decorata</i>		Herbaceous perennial	5-6
<i>Hosta fortunei</i>		Herbaceous perennial	5-6
<i>Hosta lancifolia</i>	Narrow-leaved Plantain Lily	Herbaceous perennial	5-6
<i>Hosta seiboldi</i>	Seersucker Plantain Lily	Herbaceous perennial	5-6
<i>Hydrangea macrophylla</i>	Garden Hydranges	Deciduous shrub	6
<i>Hydrangea paniculata</i>	Peegee Hydrangea	Deciduous shrub	4
<i>Hydrangea quercifolia</i>	Oakleaf Hydrangea	Deciduous shrub	4
<i>Hypericum kalmianum</i>	Kalm's St. Johns-wort	Deciduous shrub	4
<i>Hypericum patulum</i>	Goldcup St. Johns-wort	Deciduous shrub	5
<i>Hypericum prolificum</i>	Shrubby St. Johns-wort	Deciduous shrub	4
<i>Iberis sempervirens</i>	Evergreen Candytuft	Groundcover	5
<i>Ilex altaclarensis</i>		Broadleaf evergreen shrub	6
<i>Ilex aquifolium</i>	English Holly	Broadleaf evergreen shrub	6
<i>Ilex attenuata</i>		Broadleaf evergreen shrub	6
<i>Ilex cassine</i>		Broadleaf evergreen shrub	6
<i>Ilex cornuta</i>	Chinese or Horned Holly	Broadleaf evergreen shrub	6
<i>Ilex crenata</i>	Japanese Holly	Broadleaf evergreen shrub	6b

<i>Ilex decidua</i>	Possumhaw or Deciduous	Deciduous shrub	5
<i>Ilex latifolia</i>	Luster Leaf Holly	Broadleaf evergreen shrub	7
<i>Ilex X meserveae</i>	Blue Holly	Broadleaf evergreen shrub	6
<i>Ilex opaca</i>	American Holly	Broadleaf evergreen shrub	6
<i>Ilex perado</i>		Broadleaf evergreen shrub	6
<i>Ilex pernyi</i>	Pernyi Holly	Broadleaf evergreen shrub	6
<i>Ilex platyphylla</i>		Broadleaf evergreen shrub	6
<i>Ilex rotunda</i>	Round Holly	Broadleaf evergreen shrub	8
<i>Ilex verticillata</i>	Winterberry, Black Alder of Michigan Holly	Deciduous shrub	2
<i>Ilex vomitoria</i>	Yaupon Holly	Broadleaf evergreen shrub	6
<i>Illicium anisatum</i>	Japanese Anise	Broadleaf evergreen shrub	9
<i>Illicium floridanum</i>	Florida or Purple Anise	Broadleaf evergreen shrub	9
<i>Jasminum floridum</i>		Deciduous shrub	7
<i>Jasminum mesnyi</i>	Primrose Jasmine	Evergreen shrub	8
<i>Jasminum nudiflorum</i>	Winter Jasmine	Evergreen shrub	6
<i>Juglans nigra</i>	Black Walnut	Deciduous tree	4
<i>Juniperus chinensis</i>	Chinese Juniper	Evergreen tree	3
<i>Juniperus conferta</i>	Shore Juniper	Groundcover	6b-7
<i>Juniperus davurica</i>	Parson's Juniper	Groundcover	4
<i>Juniperus excelsa</i>	Spiny Greek Juniper	Evergreen tree	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Juniperus horizontalis</i>	Creeping Juniper	Groundcover	2
<i>Juniperus procumbens</i>	Japanese Garden Juniper	Groundcover	4
<i>Juniperus sabina</i>	Savin Juniper	Evergreen shrub	4
<i>Juniperus scopulorum</i>	Rocky Mountain Juniper	Evergreen shrub	4
<i>Juniperus squamata</i>	Meyer or Fishtain Juniper	Evergreen shrub	4
<i>Juniperus silicicola</i>		Narrowleaf evergreen tree	2
<i>Juniperus virginiana</i>	Eastern Redcedar	Narrowleaf evergreen tree	2
<i>Kerria japonica</i>	Japanese Kerria	Deciduous shrub	4
<i>Koelreuteria bipinnata</i>	Goldenrain Tree	Deciduous tree	7b-9
<i>Koelreuteria elegans</i>	Formosan Goldenrain Tree or Flamegold	Deciduous tree	9-10
<i>Koelreuteria formosana</i>	Goldenrain Tree	Deciduous tree	8
<i>Koelreuteria paniculate</i>	Panicled Goldenrain Tree	Deciduous shrub	5-7
<i>Kolkwitzia amabilis</i>	Beautybush	Deciduous shrub	5
<i>Lagerstroemia fauriei</i>		Deciduous shrub	5
<i>Lagerstroemia indica</i>	Crapemyrtle	Deciduous shrub	7
<i>Larix decidua</i>	European Larch	Deciduous shrub	3
<i>Larix laricina</i>	American Larch or Tamarack	Deciduous shrub	1
<i>Leucophyllum frutescens</i>	Texas Sage	Broadleaf evergreen shrub	8
<i>Libocedrus decurrens</i>	California Incense Cedar	Narrowleaf evergreen tree	5
<i>Ligustrum spp.</i>	Privet	Deciduous shrub	3-7
<i>Ligustrum japonicum</i>	Japanese or Wax Leaf Ligustrum	Broadleaf evergreen shrub	7b
<i>Ligustrum lucidum</i>		Broadleaf evergreen shrub/tree	7b
<i>Ligustrum obtusifolium</i>	Border Privet	Deciduous shrub	3
<i>Ligustrum ovalifolium</i>	California Privet	Deciduous shrub	5
<i>Ligustrum sinense</i>	Chinese Privet	Deciduous shrub	7
<i>Ligustrum texanum</i>	Wax Leaf Ligustrum	Broadleaf evergreen shrub	7b
<i>Ligustrum vicaryi</i>	Golden Vicary Privet	Deciduous shrub	4
<i>Ligustrum vulgare</i>	Common Privet	Deciduous shrub	4
<i>Liquidambar formosana</i>	Formosan Sweetgum	Deciduous shrub	4
<i>Liquidambar styraciflua</i>	Sweetgum	Deciduous shrub	4
<i>Liriodendron tulipifera</i>	Tulip Tree or Yellow Poplar	Deciduous shrub	4
<i>Liriope muscari</i>	Lily Turf, Monkey Grass, or Lirriope	Groundcover	6-7
<i>Lonicera alpigena</i>	Alps Honeysuckle	Deciduous shrub	3
<i>Lonicera fragrantissima</i>	Winter Honeysuckle	Deciduous shrub	5
<i>Lonicera japonica</i>	Japanese Honeysuckle	Broadleaf evergreen shrub	4
<i>Lonicera maackii</i>	Amur Honeysuckle	Deciduous shrub	3

<i>Lonicera morrowi</i>	Morrow Honeysuckle	Deciduous shrub	4
<i>Lonicera sempervirens</i>	Trumpet Honeysuckle	Semi-evergreen vine	4
<i>Lonicera tatarica</i>	Tatarian Honeysuckle	Deciduous shrub	3
<i>Lonicera X xylosteoides</i>	Clavey's Dwarf Honeysuckle	Deciduous shrub	3
<i>Maclura pomifera</i>	Osage Orange	Deciduous shrub	5
<i>Magnolia acuminata</i>	Cucumbertree Magnolia	Deciduous shrub	4
<i>Magnolia grandiflora</i>	Southern Magnolia or Bullbay	Broadleaf evergreen tree	7
<i>Magnolia heptapeta</i>		Deciduous tree	5
<i>Magnolia macrophylla</i>	Bigleaf Magnolia	Deciduous tree	5
<i>Magnolia quinquepeta</i>		Deciduous tree	5
<i>Magnolia soulangiana</i>	Saucer Magnolia	Deciduous tree	5
<i>Magnolia stellata</i>	Star Magnolia	Deciduous shrub	5
<i>Magnolia tripetala</i>	Umbrella Magnolia	Deciduous shrub	4
<i>Magnolia virginiana</i>	Sweetbay or Swamp Magnolia	Deciduous shrub	5
<i>Mahonia aquifolium</i>	Oregon Grape or Holly Grape Mahonia	Broadleaf evergreen shrub	5
<i>Mahonia bealei</i>	Leatherleaf Mahonia	Broadleaf evergreen shrub	6
<i>Mahonia fortunei</i>		Broadleaf evergreen shrub	8
<i>Mahonia lamariifolia</i>	Chinese Hollygrape	Broadleaf evergreen shrub	8
<i>Malus</i> spp.	Flowering Crabapple	Deciduous tree	3
<i>Malus baccata</i>		Deciduous tree	3
<i>Malus floribunda</i>		Deciduous tree	3

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Malus sargentii</i>		Deciduous tree	3
<i>Melia azedarach</i>	Chinaberry	Deciduous tree	7
<i>Metasequoia glyptostroboides</i>	Dawn Redwood	Deciduous tree	5
<i>Morus alba</i>	White Mulberry	Deciduous tree	3
<i>Morus rubra</i>	Red Mulberry	Deciduous tree	3
<i>Myrica cerifera</i>	Southern Wax Myrtle	Broadleaf evergreen tree	7
<i>Myrica pensylvanica</i>	Bayberry	Semi-evergreen shrub	5
<i>Mandina domestica</i>	Heavenly Bamboo or Nandina	Broadleaf evergreen shrub	6
<i>Nerium oleander</i>	Oleander	Broadleaf evergreen shrub	8
<i>Nyssa sylvatica</i>	Black Gum, Sour Gum, or Black Tupelo	Deciduous tree	4
<i>Ophiopogon japonicus</i>	Lily Turf or Mondo grass	Groundcover	7
<i>Opuntia</i> spp.	Prickly Pear or Cholla Cactus	Broadleaf evergreen shrub	6
<i>Opuntia engelmannii</i>	Engelman Prickly Pear	Broadleaf evergreen shrub	6
<i>Opuntia imbricata</i>	Walking Stick Cholla	Broadleaf evergreen shrub	6
<i>Opuntia lindheimeri</i>	Lindheimer Prickly Pear	Broadleaf evergreen shrub	6
<i>Osmanthus X fortunei</i>	Fortunes Osmanthus	Broadleaf evergreen shrub	7
<i>Osmanthus fragrans</i>	Fragrant Tea Olive	Broadleaf evergreen shrub	7
<i>Osmanthus heterophyllus</i>	False Holly	Broadleaf evergreen shrub	7
<i>Osmanthus ilicifolius</i>	False Holly	Broadleaf evergreen shrub	7
<i>Ostrya virginiana</i>	American or Eastern Hophornbeam	Deciduous tree	3
<i>Oxydendrum arboreum</i>	Sourwood	Deciduous tree	5
<i>Pachysandra procumbens</i>	Alleghany Pachysandra	Groundcover	5
<i>Pachysandra terminalis</i>	Pachysandra or Japanese Surge	Groundcover	4
<i>Parkinsonia aculeata</i>	Parkinsonia or Jerusalem Thorn	Deciduous tree	9
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	Deciduous vine	2
<i>Parthenocissus tricuspidata</i>	Boston Ivy	Deciduous vine	2
<i>Paulownia tomentosa</i>	Royal Paulownia or Empress Tree	Deciduous tree	6b- 7
<i>Paxistima canbyi</i>	Cliff Green or Canby Paxistima	Groundcover	5
<i>Pennisetum alopecuroides</i>	Fountain Grass	Ornamental grass	5-6
<i>Pennisetum ruppelii</i>		Ornamental grass	5-6
<i>Phellodendron amurense</i>	Amur Corktree	Deciduous shrub	4
<i>Phellodendron chinense</i>	Chinese Corktree	Deciduous shrub	4
<i>Philadelphus coronarius</i>	Sweet Mockorange	Deciduous shrub	4
<i>Philadelphus X lemoinei</i>	Lemoine Mockorange	Deciduous shrub	4
<i>Philadelphus microphyllus</i>		Deciduous shrub	4
<i>Phlox subulata</i>	Moss Pink or Moss Phlox	Groundcover	5
<i>Photinia X 'Fraseri'</i>	Fraser's Photinia	Broadleaf evergreen shrub	7
<i>Photinia glabra</i>	Japanese Photinia	Broadleaf evergreen shrub	7
<i>Photinia serrulate</i>	Chinese Photinia	Broadleaf evergreen shrub	7

<i>Phyllostachys aureosulcata</i>	Yellowgroove Bamboo	Broadleaf evergreen shrub	7
<i>Physocarpus monogymus</i>	Mountain Ninebark	Deciduous shrub	4
<i>Physocarpus opulifolius</i>	Common Ninebark	Deciduous shrub	2
<i>Picea abies</i>	Norway Spruce	Coniferous evergreen tree	3
<i>Picea glauca</i> 'Densata'	Black Hills Spruce	Coniferous evergreen tree	2
<i>Picea pungens</i>	Colorado Blue Spruce	Coniferous evergreen tree	2
<i>Pinus cembroides</i>	Pinyon Pine	Coniferous evergreen tree	4
<i>Pinus densiflora</i>	Japanese Red Pine	Coniferous evergreen tree	5
<i>Pinus densiflora</i> 'Umbraculifera'	Tanyosho Pine	Coniferous evergreen tree	5
<i>Pinus echinata</i>	Shortleaf Pine	Coniferous evergreen tree	6
<i>Pinus elliotti</i>	Slash Pine	Coniferous evergreen tree	7
<i>Pinus flexilis</i>	Limber Pine	Coniferous evergreen tree	3
<i>Pinus glabra</i>	Spruce Pine	Coniferous evergreen tree	7
<i>Pinus mugo</i> (mugho)	Mugo Pine	Evergreen shrub/tree	3
<i>Pinus nigra</i>	Austrian Pine	Coniferous evergreen tree	4
<i>Pinus palustris</i>	Longleaf Pine	Coniferous evergreen tree	7
<i>Pinus pinaster</i>	Cluster or Maritime Pine	Coniferous evergreen tree	6
<i>Pinus ponderosa</i>	Ponderosa or Western Yellow Pine	Coniferous evergreen tree	5
<i>Pinus resinosa</i>	Red or Norway Pine	Coniferous evergreen tree	2
<i>Pinus strobiformis</i>	Western White Pine	Coniferous evergreen tree	3
<i>Pinus sylvestris</i>	Scotch (Scot's) Pine	Coniferous evergreen tree	

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Pinus taeda</i>	Loblolly Pine	Coniferous evergreen tree	6
<i>Pinus thunbergiana</i>	Japanese Black Pine	Coniferous evergreen tree	6
<i>Pinus thunbergi</i>	Japanese Black Pine	Coniferous evergreen tree	6
<i>Pistacia chinensis</i>	Chinese Pistache	Deciduous shrub	6
<i>Pistacia vera</i>	Pistacio	Deciduous shrub	8-9
<i>Pittosporum tobira</i>	Japanese Pittosporum or Mockorange	Broadleaf evergreen shrub	8
<i>Platanus X acerifolia</i>	London Planetree	Deciduous shrub	4
<i>Platanus occidentalis</i>	Sycamore or American Planetree	Deciduous shrub	3
<i>Platanus orientalis</i>	Oriental Planetree	Deciduous shrub	4
<i>Platyclusus orientalis</i>	Oriental Arborvitae	Evergreen shrub	5
<i>Podocarpus gracilior</i>	Fern Podocarpus	Evergreen shrub	10
<i>Podocarpus macrophyllus</i>	Yew Podocarpus	Evergreen shrub	8
<i>Podocarpus nagi</i>		Evergreen shrub	9-10
<i>Poncirus trifoliata</i>	Trifoliolate Orange	Deciduous shrub	6
<i>Populus alba</i>	White Poplar	Deciduous shrub	3
<i>Populus deltoides</i>	Eastern Cottonwood	Deciduous shrub	3
<i>Populus nigra 'Italica'</i>	Lombardy Poplar	Deciduous shrub	3
<i>Potentilla fruticosa</i>	Potentilla or Bush Cinquefoil	Deciduous shrub	2
<i>Prunus armeniaca</i>	Apricot	Deciduous shrub	5
<i>Prunus caroliniana</i>	Carolina Cherry Laurel	Broadleaf evergreen tree	7
<i>Prunus cerasifera</i>	Purpleleaf Plum	Deciduous shrub	3
<i>Prunus X cistena</i>	Purpleleaf Sand Cherry	Deciduous shrub	4
<i>Prunus glandulosa</i>	Flowering Almond	Deciduous shrub	4
<i>Prunus laurocerasus</i>	Cherry Laurel or English Laurel	Broadleaf evergreen tree	7
<i>Prunus persica</i>	Common Peach	Deciduous tree	5
<i>Prunus pumila</i>	Sand Cherry	Deciduous tree	4
<i>Prunus serotina</i>	Black Cherry	Deciduous tree	3
<i>Prunus serrulata</i>	Japanese Flowering Cherry	Deciduous tree	6
<i>Pseudotsuga menziesi</i>	Balsam Fir	Coniferous evergreen tree	4-6
<i>Punica granatum</i>	Pomegranate	Deciduous shrub	7
<i>Pyracantha coccinea</i>	Pyracantha or Firethorn	Broadleaf evergreen shrub	5-6
<i>Pyracantha koidzumi</i>	Formosa Pyracantha	Broadleaf evergreen shrub	8
<i>Pyrus calleryana</i>	Callery Pear	Deciduous tree	4
<i>Pyrus communis</i>	Common Pear	Deciduous tree	5
<i>Quercus spp.</i>	Oaks	Deciduous tree	3-6
<i>Quercus acutissima</i>	Sawtooth Oak	Deciduous tree	4
<i>Quercus alba</i>	White Oak	Deciduous tree	3
<i>Quercus bicolor</i>	Swamp White Oak	Deciduous tree	3
<i>Quercus borealis</i>	Northern Red Oak	Deciduous tree	3

<i>Quercus falcata</i>	Southern Red Oak	Deciduous tree	4
<i>Quercus imbricaria</i>	Shingle Oak	Deciduous tree	4
<i>Quercus laurifolia</i>	Laurel Oak	Deciduous tree	6
<i>Quercus macrocarpa</i>	Bur Oak	Deciduous tree	3
<i>Quercus marilandica</i>	Blackjack Oak	Deciduous tree	4
<i>Quercus muehlenbergi</i>	Chinquapin Oak, Yellow Chestnut Oak	Deciduous tree	3
<i>Quercus nigra</i>	Water Oak	Deciduous tree	6
<i>Quercus palustris</i>	Pin Oak	Deciduous tree	3
<i>Quercus phellos</i>	Willow Oak	Deciduous tree	4
<i>Quercus robur</i>	English Oak	Deciduous tree	4
<i>Quercus rubra</i>	Northern Red Oak	Deciduous tree	3
<i>Quercus shumardi</i>	Shumard Oak	Deciduous tree	3
<i>Quercus stellata</i>	Post Oak	Deciduous tree	4
<i>Quercus virginiana</i>	Live Oak	Broadleaftree	7
<i>Raphiolepis indica</i>	Indian Hawthorn	Broadleaf evergreen shrub	7b
<i>Raphiolepis umbellata</i>	Round Leaf Hawthorn	Broadleaf evergreen shrub	7b
<i>Rhamnus cathartica</i>	Common Buckthorn	Deciduous tree	2
<i>Rhamnus davurica</i>		Deciduous tree	5
<i>Rhamnus frangula</i>	Glossy Buckthorn	Deciduous tree	2
<i>Rhapidophyllum hystrix</i>	Needle Palm	Broadleaf evergreen shrub	7b
<i>Rhododendron spp.</i>	Evergreen Rhododendron	Broadleaf evergreen shrub	5

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Rhododendron catawbiense</i>	Catawba Rhododendron	Broadleaf evergreen shrub	5
<i>Rhododendron indicum</i>	Southern or Indica Azalea	Broadleaf evergreen shrub	7
<i>Rhododendron obtusum</i>	Kurume Azalea	Broadleaf evergreen shrub	6
<i>Rhododendron simsii</i>	Southern Azalea	Broadleaf evergreen shrub	7
<i>Rhodotypos scandens</i>	Black Jetbead	Deciduous shrub	5
<i>Rhus aromatica</i>	Fragrant Sumac	Deciduous shrub	4
<i>Rhus copallina</i>	Winged, Shining, or Planeleaf Sumac	Deciduous shrub	2
<i>Rhus glabra</i>	Smooth Sumac	Deciduous shrub	2
<i>Rhus typhina</i>	Staghorn or Velvet Sumac	Deciduous shrub	2
<i>Ribes alpinum</i>	Alpine Currant	Deciduous shrub	3
<i>Ribes cynosbati</i>	Prickly Gooseberry	Deciduous shrub	2
<i>Ribes hirtellum</i>	Common Gooseberry	Deciduous shrub	2
<i>Robinia pseudoacacia</i>	Black Locust	Deciduous tree	4
<i>Rosa</i> spp.	Rose	Deciduous shrub	4
<i>Rosa rugosa</i>	Rugosa Rose	Deciduous shrub	2
<i>Rosemarinus officinalis</i>	Rosemary	Narrowleaf evergreen shrub	7
<i>Sabal minor</i>	Bush Palmetto or Dwarf Palm	Broadleaftree	8b
<i>Sabal palmetto</i>	Sabal Palm	Broadleaftree	8b
<i>Salix alba</i>	Yellow-stemmed Weeping Willow	Deciduous tree	3
<i>Salix babylonica</i>	Weeping Willow	Deciduous tree	3
<i>Salix</i> X 'Blanda'		Deciduous tree	3
<i>Salix discolor</i>	Pussy Willow	Deciduous tree	2
<i>Salix gracilistyla</i>	Rosegold Pussy Willow	Deciduous shrub	2
<i>Salix matsudana</i> 'Tortuosa'	Corkscrew Willow	Deciduous tree	4
<i>Salix nigra</i>	Black Willow	Deciduous tree	3
<i>Santolina chamaecyparissus</i>	Gray Santolina	Groundcover	6
<i>Santolina virens</i>	Green Santolina	Groundcover	7
<i>Sapindus drummondii</i>	Western Soapberry	Deciduous tree	5
<i>Sapium sebiferum</i>	Chinese Tallow Tree	Deciduous tree	8
<i>Sassafras albidum</i>	Sassafras	Deciduous tree	5
<i>Sasa palmata</i>	Palmate Bamboo	Broadleaf evergreen shrub	6
<i>Sasa pigmaea</i>	Dwarf Bamboo	Broadleaf evergreen shrub	7
<i>Sedum acre</i>	Gold Moss Stonecrop	Groundcover	4
<i>Sedum spectabile</i>		Groundcover	4
<i>Sedum spurium</i>		Groundcover	3
<i>Serenoa repens</i>	Saw Palmetto	Broadleaf evergreen tree	8b
<i>Sophora japonica</i>	Japanese Pagoda Tree	Deciduous tree	4
<i>Sorbus aucuparia</i>	European Mountain Ash	Deciduous tree	3
<i>Spiraea albi flora</i>		Deciduous shrub	2

<i>Spiraea X arguta</i>	Garland Spiraea	Deciduous shrub	3
<i>Spiraea X bumalda</i>		Deciduous shrub	2
<i>Spiraea cantoniensis</i>	Reeves Spiraea	Deciduous shrub	3
<i>Spiraea japonica</i>	Japanese Spiraea	Deciduous shrub	5
<i>Spiraea X multiflora</i>		Deciduous shrub	3
<i>Spiraea prunifolia</i>	Bridal Wreath	Deciduous shrub	3
<i>Spiraea thunbergi</i>	Thunberg spiraea	Deciduous shrub	3
<i>Spiraea trilobata</i>		Deciduous shrub	3
<i>Spiraea X vanhouttei</i>	Vanhoutte Spiraea	Deciduous shrub	3
<i>Syringa afghinaca</i>		Deciduous shrub	3
<i>Syringa amurensis</i>	Japanese Tree Lilac	Deciduous tree	3
<i>Syringa X chinensis</i>	Chinese Lilac	Deciduous shrub	3
<i>Syringa laciniata</i>	Cutleaf Lilac	Deciduous shrub	3
<i>Syringa meyeri</i>	Meyer Lilac	Deciduous shrub	3
<i>Syringa pekinensis</i>	Chinese or Pekin Tree Lilac	Deciduous tree	3
<i>Syringa persica</i>	Persian Lilac	Deciduous shrub	5
<i>Syringa reticulata</i>	Japanese Tree Lilac	Deciduous tree	3
<i>Syringa vulgaris</i>	Common Lilac	Deciduous shrub	3
<i>Taxodium ascendens</i>	Pond Cypress	Deciduous tree	4
<i>Taxodium distichum</i>	Bald Cypress	Deciduous tree	4

Scientific Name Index for Field-Grown Nursery Crops --Continued

Scientific name	Common name(s)	Kind	Hardiness zone
<i>Taxus</i> spp.	Yew	Evergreen shrub	4-6
<i>Taxus baccata</i>	English Yew	Evergreen shrub	6
<i>Taxus capitata</i>	Japanese Yew	Evergreen shrub	4
<i>Taxus cuspidata</i>	Japanese Yew	Evergreen shrub	4
<i>Taxus media</i>	Hybrid yews	Evergreen shrub	4
<i>Ternstroemia japonica</i>	Japanese Cleyers	Broadleaf evergreen shrub	7
<i>Thuja occidentalis</i>	Oriental or Chinese Arborvitae	Narrowleaf evergreen tree	7
<i>Tilia americana</i>	American Linden or Basswood	Deciduous tree	3
<i>Tilia X euchlora</i> 'Redmond'		Deciduous tree	3
<i>Tilia cordata</i>	European Littleleaf Linden	Deciduous tree	3
<i>Tilia tomentosa</i>	Silver Linden	Deciduous tree	4
<i>Trachelospermum asiaticum</i>	Japanese Star Jasmine	Groundcover/vine	8
<i>Trachelospermum jasminoides</i>	Confederate or Star Jasmine	Groundcover/vine	8
<i>Trachycarpus fortunei</i>	Windmill Palm	Broadleaf evergreen tree	8
<i>Tsuga canadensis</i>	Canadian or Eastern Hemlock	Coniferous evergreen tree	3
<i>Tsuga caroliniana</i>	Carolina Hemlock	Coniferous evergreen tree	5
<i>Ulmus alata</i>	Winged Elm	Deciduous tree	6
<i>Ulmus americana</i>	American Elm	Deciduous tree	2
<i>Ulmus crassifolia</i>	Cedar Elm	Deciduous tree	6
<i>Ulmus japonica</i>	Japanese Elm	Deciduous tree	2
<i>Ulmus parvifolia</i>	Lacebark or Chinese Elm	Deciduous tree	4-5
<i>Ulmus pumila</i>	Siberian Elm	Deciduous tree	3
<i>Ulmus sempervirens</i>	Lacebark Elm	Deciduous tree	4-5
<i>Viburnum</i> spp.	Viburnum	Deciduous shrub	4-5
<i>Viburnum X</i> 'Burkwoodi'	Burkwood Viburnum	Deciduous shrub	5
<i>Viburnum carlesii</i>	Koreanspice or Mayflower Viburnum		Deciduous shrub
	5		
<i>Viburnum dentatum</i>	Arrowwood viburnum	Deciduous shrub	3
<i>Viburnum lantana</i>	Wayfaringtree Viburnum	Deciduous shrub	3
<i>Viburnum lentago</i>	Nannyberry Viburnum	Deciduous shrub	3
<i>Viburnum odoratissimum</i>	Sweet Viburnum	Broadleaf evergreen shrub	8
<i>Viburnum opulus</i>	European Cranberrybush Viburnum	Broadleaf evergreen shrub	3
<i>Viburnum plicatum</i>	Doublefile Viburnum	Deciduous shrub	5
<i>Viburnum rhytidophylloides</i>		Broadleaf evergreen shrub	6
<i>Viburnum rhytidophyllum</i>	Leatherleaf Viburnum	Broadleaf evergreen shrub	5
<i>Viburnum sieboldi</i>	Siebold Viburnum	Deciduous shrub	5
<i>Viburnum suspensum</i>	Sandanqua Viburnum	Broadleaf evergreen shrub	8
<i>Viburnum tinus</i>	Laurestinus	Broadleaf evergreen shrub	8
<i>Viburnum trilobum</i>	American Cranberrybush Viburnum	Deciduous shrub	2

Viburnum utile		Deciduous shrub	5
Vinca major	Periwinkle	Ground cover	6
Vinca minor	Common Periwinkle	Ground cover	3
Vitex agnus-castus	Chaste Tree	Deciduous shrub	6
Vitex negundo		Deciduous shrub	6
Washington filifera	Washington Palm	Broadleaf tree	8
Washington robusta	Mexican Palm	Broadleaf tree	8
Weigela florida	Weigela	Deciduous shrub	4-5
Wisteria floribunda	Japanese Wisteria	Deciduous shrub	5
Xanthoceras sorbifolium	Popcorn Shrub	Deciduous shrub	6
Yucca aloifolia	Spanish Bayonet	Broadleaf evergreen shrub	6
Yucca elephantipes		Broadleaf evergreen shrub	9b-10
Yucca filamentosa	Adam's Needle Yucca	Broadleaf evergreen shrub	4
Yucca gloriosa	Mound Lily Yucca	Broadleaf evergreen shrub	6
Yucca parviflora	Red Yucca	Broadleaf evergreen shrub	7
Zelkova serrata	Japanese Zelkova	Deciduous tree	4
Ziziphus jujuba	Jujube or False Date	Deciduous tree	7

Enclosures

- ! 1994 U.S. Landscape Tree Planting Survey -- Executive Summary Index to Common Names
- ! Plant Regulatory Officials of the United States, Canada, and Mexico
- ! Directory of State Nursery Associations
- ! Summary of Nursery Stock By County, State of Florida
- ! Glossary of Nursery Terms
- ! USDA Plant Hardiness Zone Map
- ! Scope V of The Nursery Industry Research Summary, A Study Involving the Firms Composing the Wholesale Grower Portion of the Nursery Industry in the United States
- ! Trade Flows and Marketing Practices within the United States Nursery Industry